
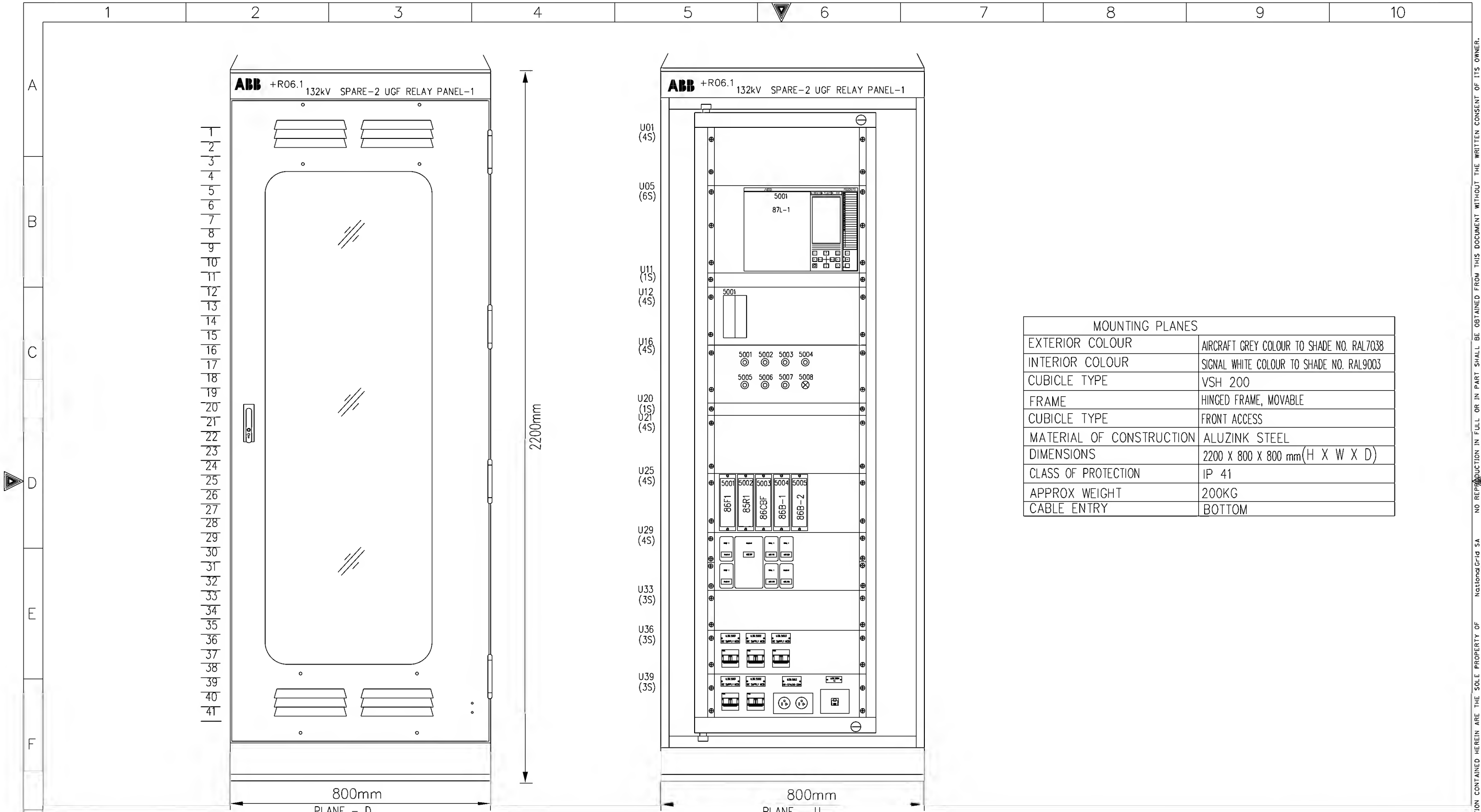


| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|---|-----------------|--------------------------|---|-----------------------|---|---------------------------------------|------------------------------|--|--|--------------------------|--|-----------------------|--|-------------|--|----|-------|-----------------|--------------|--|----------------|--|---------------------------------------|--|----|-------|--------------|-------------------------|--|----------------------|--|--------------------------------------|--|----------|------|-------------|------------------|--|---------------------|--|---------------------|--|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | <div><div></div><div>POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656</div></div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | CONTRACTOR : ABB Contracting Company | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CLIENT : National GridSA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D | PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SUBSTATION : S/S 8709 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E | CONTRACT NO. : 11131113/00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | TITLE : Assembly Drawing – +R06.1 [Under Gr | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G | <table><tr><td colspan="3">AS-BUILT BY _____ DATE _____</td><td colspan="2">CONTRACT NO. 11131113/00</td><td colspan="2">JOB ORDER NO. S-13656</td><td colspan="2">COVER SHEET</td></tr><tr><td>Ø1</td><td>13 49</td><td>FACTORY ASBUILT</td><td colspan="2">DRAWN BY RIZ</td><td colspan="2">CHECKED BY KVR</td><td colspan="2">132kV UGF-SPARE-2 RELAY PANEL-1+R06.1</td></tr><tr><td>ØØ</td><td>13 04</td><td>FOR APPROVAL</td><td colspan="2">DATE STARTED 24.01.2013</td><td colspan="2">DATE COMPLETED _____</td><td colspan="2">S/S 8709-132/13.8KV IN AL-KHARJ CITY</td></tr><tr><td>REV. NO.</td><td>DATE</td><td>DESCRIPTION</td><td colspan="2">OPRG. DEPT. CTPD</td><td colspan="2">ENG. DEPT. AUT-PSAC</td><td colspan="2">RIYADH SAUDI ARABIA</td></tr></table> | | | | | | | AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | COVER SHEET | | Ø1 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | | CHECKED BY KVR | | 132kV UGF-SPARE-2 RELAY PANEL-1+R06.1 | | ØØ | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | |
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | COVER SHEET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ø1 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | | CHECKED BY KVR | | 132kV UGF-SPARE-2 RELAY PANEL-1+R06.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ØØ | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

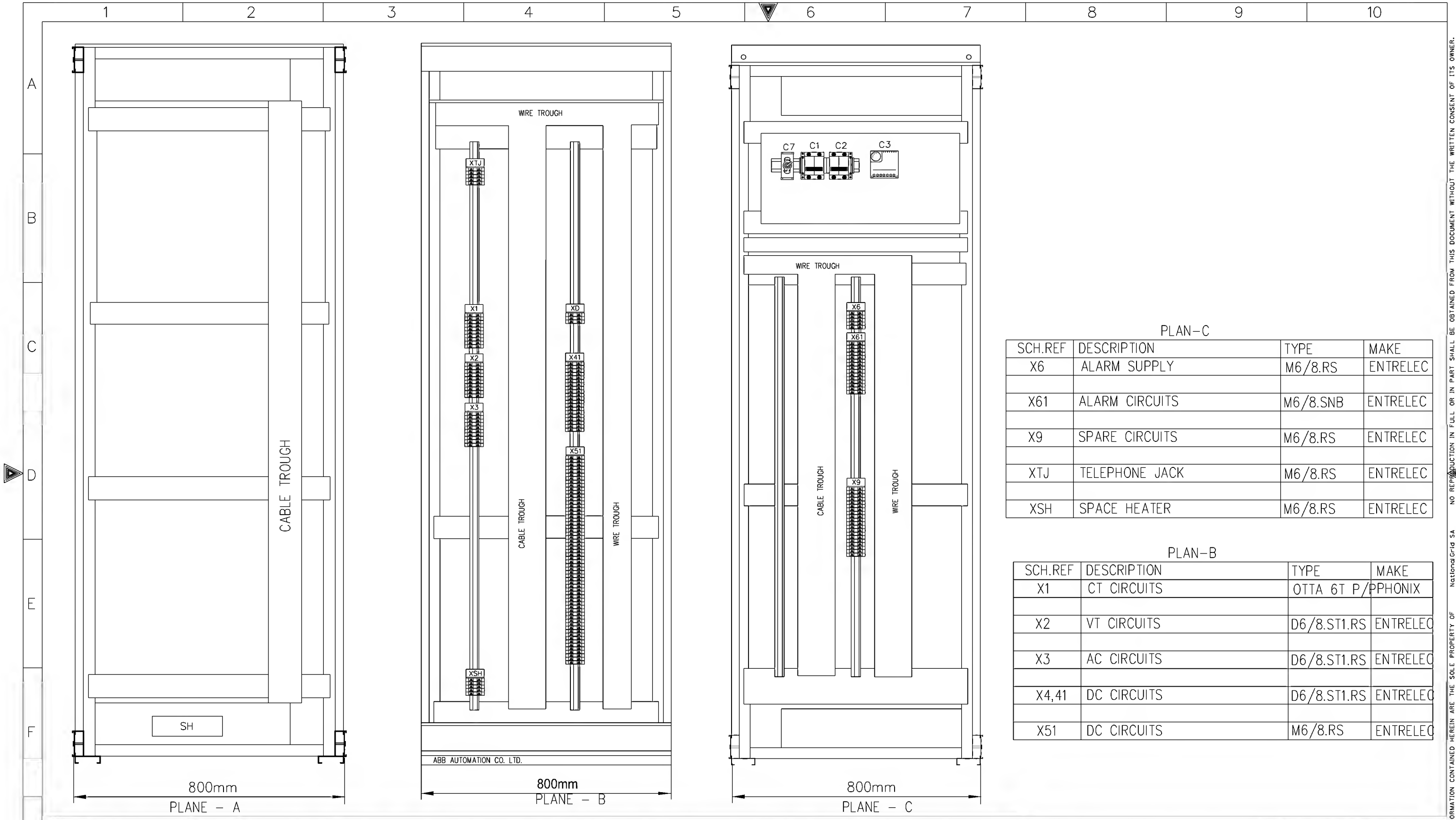


| MOUNTING PLANES | |
|--------------------------|---|
| EXTERIOR COLOUR | AIRCRAFT GREY COLOUR TO SHADE NO. RAL7038 |
| INTERIOR COLOUR | SIGNAL WHITE COLOUR TO SHADE NO. RAL9003 |
| CUBICLE TYPE | VSH 200 |
| FRAME | HINGED FRAME, MOVABLE |
| CUBICLE TYPE | FRONT ACCESS |
| MATERIAL OF CONSTRUCTION | ALUZINK STEEL |
| DIMENSIONS | 2200 X 800 X 800 mm(H X W X D) |
| CLASS OF PROTECTION | IP 41 |
| APPROX WEIGHT | 200KG |
| CABLE ENTRY | BOTTOM |

| | | | |
|------------------------------|-------|--|-----------------------|
| AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656 |
| 01 | 13 49 | DRAWN BY RIZ CHECKED BY KVR | |
| 00 | 13 04 | DATE STARTED 24.01.2013 DATE COMPLETED _____ | |
| REV. NO. | DATE | DESCRIPTION | |
| | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | |

| ASSEMBLY DRAWING | |
|---|--|
| 132kV UGF-SPARE-2-2 RELAY PANEL-1+R06.1 | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | |
| RIYADH SAUDI ARABIA | |

| | | | |
|------------------------------|-----------|------------------|-----------|
| الشركة الوطنية لنقل الكهرباء | | نقل الكهرباء | |
| | | National Grid sa | |
| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. |
| - | C421 | CD-322920 | SHT CONT. |
| | | | REV. NO. |
| | | | 01 |



PLAN-C

| SCH.REF | DESCRIPTION | TYPE | MAKE |
|---------|----------------|----------|----------|
| X6 | ALARM SUPPLY | M6/8.RS | ENTRELEC |
| X61 | ALARM CIRCUITS | M6/8.SNB | ENTRELEC |
| X9 | SPARE CIRCUITS | M6/8.RS | ENTRELEC |
| XTJ | TELEPHONE JACK | M6/8.RS | ENTRELEC |
| XSH | SPACE HEATER | M6/8.RS | ENTRELEC |

PLAN-B

| SCH.REF | DESCRIPTION | TYPE | MAKE |
|---------|-------------|-------------|----------|
| X1 | CT CIRCUITS | OTTA 6T P/ | PPHONIX |
| X2 | VT CIRCUITS | D6/8.ST1.RS | ENTRELEC |
| X3 | AC CIRCUITS | D6/8.ST1.RS | ENTRELEC |
| X4,41 | DC CIRCUITS | D6/8.ST1.RS | ENTRELEC |
| X51 | DC CIRCUITS | M6/8.RS | ENTRELEC |

AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

| 01 | 13 49 | FACTORY ASBUILT |
|----------|-------|-----------------|
| 00 | 13 04 | FOR APPROVAL |
| REV. NO. | DATE | DESCRIPTION |

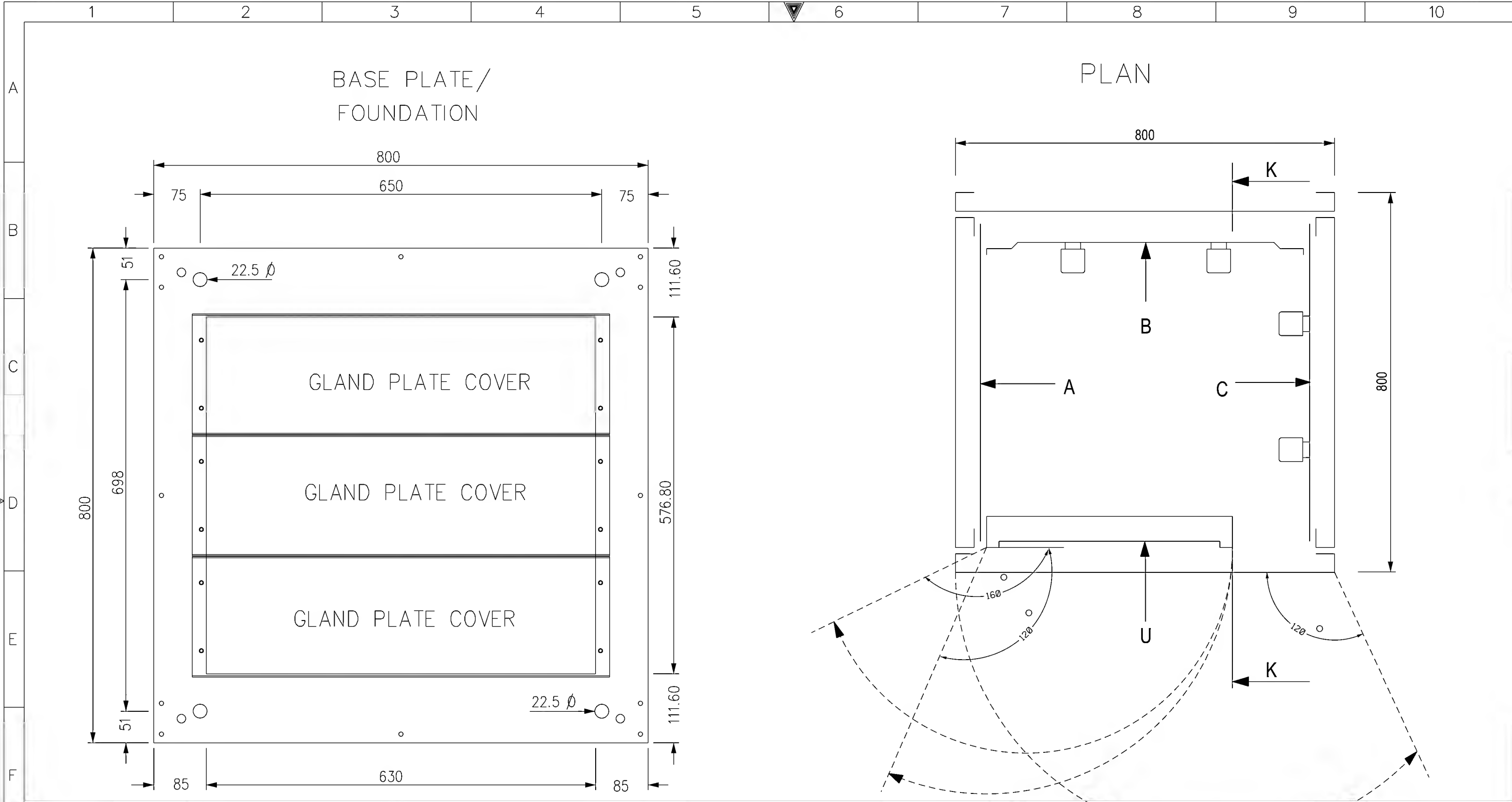
DRAWN BY RIZ CHECKED BY KVR
DATE STARTED 24.01.2013 DATE COMPLETED _____
OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

ASSEMBLY DRAWING

132kV UGF-SPARE-2-2 RELAY PANEL-1+R06.1
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
National Grid sa

| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
|-------|-----------|----------------|-----------|----------|
| - | C421 | CD-322920 | SHT CONT. | 01 |
| | | | G02G03 | |



AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

| | | |
|----------|-------|-----------------|
| 01 | 13 49 | FACTORY ASBUILT |
| 00 | 13 04 | FOR APPROVAL |
| REV. NO. | DATE | DESCRIPTION |

DRAWN BY RIZ CHECKED BY KVR
DATE STARTED 24.01.2013 DATE COMPLETED _____
OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

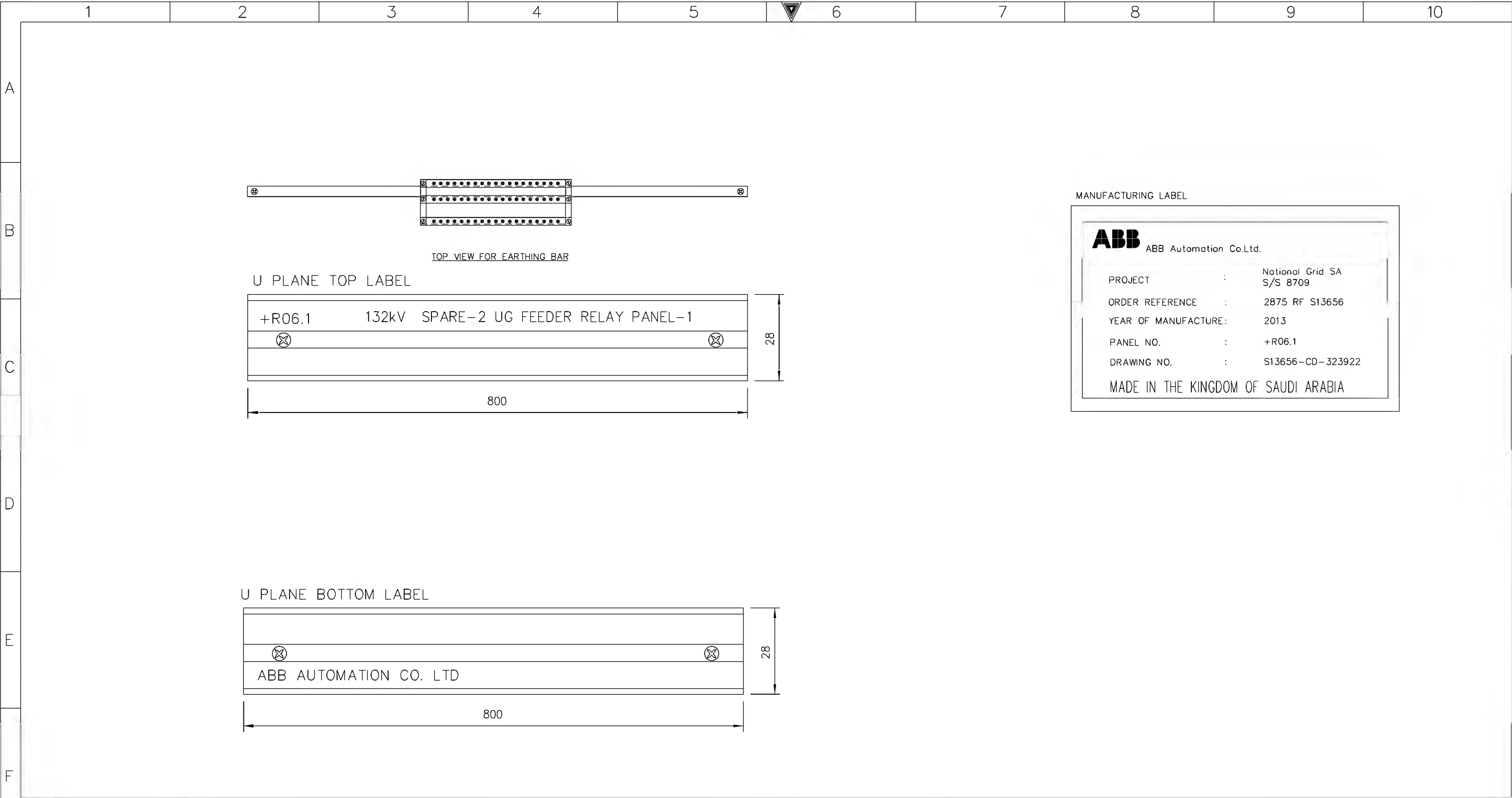
ASSEMBLY DRAWING

132kV UGF-SPARE-2 RELAY PANEL-1+R06.1
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
|-------|-----------|----------------|-----------|----------|
| - | C421 | CD-322920 | G03G04 | 01 |



MANUFACTURING LABEL

ABB Automation Co.Ltd.

PROJECT : National Grid SA
S/S 8709

ORDER REFERENCE : 2875 RF S13656





YEAR OF MANUFACTURE: 2013

PANEL NO. : +R06.1

DRAWING NO. : S13656-CD-323922

MADE IN THE KINGDOM OF SAUDI ARABIA

| | | | | | | | | | | | | | | |
|------------------------------|-------|-----------------|--------------------------|--|-----------------------|--|---------------------------------------|--|--|--|-----------|----------------|--|-----------|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | ASSEMBLY DRAWING | | | <div>الشركة الوطنية لنقل الكهرباء</div> <div> National Grid sa</div> | | | | |
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | | CHECKED BY KVR | | 132kV UGF-SPARE-2 RELAY PANEL-1+R06.1 | | | INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | | DATE COMPLETED | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | - | C421 | CD-322920 | | SHT |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | | | | | | CONT. |
| | | | | | | | | | | | | G04 L00 | | 01 |

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| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A |  | | POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656 | | | | | ABB AUTOMATION COMPANY LTD., 414, AL-KHARJ ROAD SECOND INDUSTRIAL CITY RIYADH-11383 K.S.A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | CONTRACTOR : ABB Contracting Company | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CLIENT : National Gridsa | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D | PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SUBSTATION : S/S 8709 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E | CONTRACT NO. : 11131113/00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | TITLE : LIST OF APPARATUS +R06.1 [Under Ground Feeder] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G | <table><tr><td colspan="3">AS-BUILT BY _____ DATE _____</td><td colspan="2">CONTRACT NO. 11131113/00</td><td colspan="2">JOB ORDER NO. S-13656</td><td colspan="3">COVER SHEET</td><td colspan="2"> نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa</td></tr><tr><td>01</td><td>13 49</td><td>FACTORY ASBUILT</td><td colspan="3">DRAWN BY RIZ CHECKED BY KVR</td><td colspan="3">132kV UGF-SPARE-2 RELAY PANEL-1+R06.1</td><td>INDEX</td><td>PLANT NO.</td><td>DRAWING NUMBER</td><td>SHEET NO.</td><td>REV. NO.</td></tr><tr><td>00</td><td>13 04</td><td>FOR APPROVAL</td><td colspan="3">DATE STARTED 24.01.2013 DATE COMPLETED _____</td><td colspan="3">S/S 8709-132/13.8KV IN AL-KHARJ CITY</td><td>-</td><td>C421</td><td>CD-322920</td><td>SHT L00</td><td>CONT. L01</td></tr><tr><td>REV. NO.</td><td>DATE</td><td>DESCRIPTION</td><td colspan="3">OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC</td><td colspan="3">RIYADH SAUDI ARABIA</td><td colspan="5"></td></tr></table> | | | | | | | | | | AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | COVER SHEET | | |  نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa | | 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ CHECKED BY KVR | | | 132kV UGF-SPARE-2 RELAY PANEL-1+R06.1 | | | INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. | 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | - | C421 | CD-322920 | SHT L00 | CONT. L01 | REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | | RIYADH SAUDI ARABIA | | | | | | | |
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | COVER SHEET | | |  نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ CHECKED BY KVR | | | 132kV UGF-SPARE-2 RELAY PANEL-1+R06.1 | | | INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | - | C421 | CD-322920 | SHT L00 | CONT. L01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | | RIYADH SAUDI ARABIA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

NG/D2-D (2012/01)

DMS

VECTOR

NGD200

| | | | | | | | | | | | |
|------------------------------|---------|--------------------------------------|-----------|---|---|---------------------------------------|------|---|--------|--|-------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| A | SR. NO. | GA. REF. | SCH. REF. | D E S C R I P T I O N | | SHT. | QTY. | TYPE | MAKE | ORDERING INFORMATION | COUNTRY OF ORIGIN |
| | 8 | U25.5001 | 86F1 | HIGH BURDEN TYPE HAND/ELECTRICAL RESET TRIP RELAY | | 232 | 1 | MVAJ105 | ALSTOM | MVAJ105RA0802A | UK |
| | | | | AUXILIARY VOLTAGE : 110 - 125V DC | | | | | | | |
| | | | | OUTPUT CONTACTS : 8NO+2NC | | | | | | | |
| B | | | | OPERATION INDICATOR : HAND RESET FLAG | | | | | | | |
| | 9 | U25.5002 | 85R1 | HIGH BURDEN TYPE SELF RESET TRIP RELAY | | 233 | 1 | MVAJ101 | ALSTOM | MVAJ101RA0800A | UK |
| | | | | AUXILIARY VOLTAGE : 110 - 125V DC | | | | | | | |
| | | | | OUTPUT CONTACTS : 10 NO | | | | | | | |
| C | | | | OPERATION INDICATOR : SELF RESET FLAG | | | | | | | |
| | 10 | U25.5003 | 86CBF | HIGH BURDEN TYPE HAND/ELECTRICAL RESET TRIP RELAY | | 276 | 1 | MVAJ105 | ALSTOM | MVAJ105RA0802A | UK |
| | | | | AUXILIARY VOLTAGE : 110 - 125V DC | | | | | | | |
| | | | | OUTPUT CONTACTS : 8NO+2NC | | | | | | | |
| D | | | | OPERATION INDICATOR : HAND RESET FLAG | | | | | | | |
| | 11 | U25.5004 | 86B-1 | HIGH BURDEN TYPE HAND/ELECTRICAL RESET TRIP RELAY | | 276 | 1 | MVAJ105 | ALSTOM | MVAJ105RA0802A | UK |
| | | | | AUXILIARY VOLTAGE : 110 - 125V DC | | | | | | | |
| | | | | OUTPUT CONTACTS : 8NO+2NC | | | | | | | |
| E | | | | OPERATION INDICATOR : HAND RESET FLAG | | | | | | | |
| | 12 | U25.5005 | 86B-2 | HIGH BURDEN TYPE HAND/ELECTRICAL RESET TRIP RELAY | | 277 | 1 | MVAJ105 | ALSTOM | MVAJ105RA0802A | UK |
| | | | | AUXILIARY VOLTAGE : 110 - 125V DC | | | | | | | |
| | | | | OUTPUT CONTACTS : 8NO+2NC | | | | | | | |
| F | | | | OPERATION INDICATOR : HAND RESET FLAG | | | | | | | |
| | | | | | | | | | | | |
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| AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | LIST OF APPARATUS | | الشركة الوطنية لنقل الكهرباء National Grid sa | | | |
| 13 49 | | DRAWN BY RIZ CHECKED BY KVR | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | 132kV UGF-SPARE-2 RELAY PANEL-1+R06.1 | | INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO. | | | |
| 00 13 04 FOR APPROVAL | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | - C421 | | CD-322920 | | L02 L03 01 | |
| REV. NO. DATE DESCRIPTION | | | | RIYADH SAUDI ARABIA | | | | | | NG/D2-D (2012/01) DMS VECTOR NGD200 | |

| | | | | | | | | | | | | | |
|-------------------|------------------------------|----------|--------------------------|-------------------------------------|--|---------|---------------------------------------|---------|--|----------------------|-------------------|-----------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | | |
| A | SR. NO. | GA. REF. | SCH. REF. | D E S C R I P T I O N | | SHT. | QTY. | TYPE | MAKE | ORDERING INFORMATION | COUNTRY OF ORIGIN | | |
| | 13 | U29.101 | 74R1/74IT1 | DUAL COIL RELAY FOR R1 DC /74IT1 DC | | 232,233 | 2 | RXSF 1 | ABB | RK 271 019-AN | SWEDEN | | |
| | | U29.301 | 74RS/74IS | AUXILIARY VOLTAGE : 110-125VDC | | 277 | | | | | | | |
| | | | | CONTACT DATA : 1NO + 2NC PER COIL | | | | | | | | | |
| B | 14 | U29.107 | K01M | BISTABLE RELAY | | 232 | 1 | RXMVB 4 | ABB | RK 251 401-AP | SWEDEN | | |
| | | | | AUXILIARY VOLTAGE : 125V DC | | | | | | | | | |
| | | | | CONTACT DATA : 7NC+7NO | | | | | | | | | |
| | | | | | | | | | | | | | |
| C | 15 | U29.119 | TMR/86F1 | DELAY FOR PICKUP RELAY | | 232 | 3 | RXKL1 | ABB | 1MR 000 066-AB | SWEDEN | | |
| | | U29.319 | TMR/86B-1 | AUXILIARY VOLTAGE : 24-250V DC | | 276 | | | | | | | |
| | | U29.125 | TMR/86B-2 | CONTACT DATA : 2C/O | | 277 | | | | | | | |
| | | | | | | | | | | | | | |
| D | 16 | U29.325 | R1 | RESISTOR UNIT FOR TCS | | 291 | 1 | RXTMA1 | ABB | RK 711 008-AF | SWEDEN | | |
| | | | | RESISTOR WATT : 6.8 K OHMS | | | | | | | | | |
| | | | | | | | | | | | | | |
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| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | LIST OF APPARATUS | | الشركة الوطنية لنقل الكهرباء National Grid sa | | | | |
| | 01 | 13 49 | FACTORY ASBUILT | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-SPARE-2 RELAY PANEL-1+R06.1 | | INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
| | 00 | 13 04 | FOR APPROVAL | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | | SHT | CONT. |
| | REV. NO. | DATE | DESCRIPTION | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | - | C421 | CD-322920 | L03 | L04 01 |
| NG/D2-D (2012/01 | | | | | | | | | | | | | |
| DMS VECTOR NGD200 | | | | | | | | | | | | | |

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE THE SOLE PROPERTY OF National Grid SA. NO REPRODUCTION IN FULL OR IN PART SHALL BE OBTAINED FROM THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ITS OWNER.

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| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| A | SR. NO. | GA REF. | SCH. REF. | D E S C R I P T I O N | | SHEET NO. | QTY. | TYPE | MAKE | ORDERING INFORMATION | COUNTRY OF ORIGIN |
| | 17 | | | MCB 2 POLE 6A, FOR DC SUPPLY WITH 2NC AUXILIARY CONTACT | | 216 | 5 | S282UC-K6 S2-H02 | ABB | GH S282 0164 R0317 GH S270 1916 R0003 | GERMANY |
| | | U39.5001 | Q1 | R1± SUPPLY | | | | | | | |
| | | U39.5002 | Q2 | IT1± SUPPLY | | | | | | | |
| | | U36.5001 | Q3 | RS± SUPPLY | | | | | | | |
| | | U36.5002 | Q4 | IS± SUPPLY | | | | | | | |
| B | | U36.5003 | Q5 | TC1± SUPPLY | | | | | | | |
| | 18 | U39.5003 | C01 | CONVENIENCE OUTLET 10A, 127V AC | | 211 | 1 | USM45 & USMS45 | LEGRAND | 74140 & 74180 | FRANCE |
| | | | C02 | CONVENIENCE OUTLET 10A, 220V AC | | | | | | | |
| | 19 | | C1,C2 | MINIATURE CIRCUIT BREAKER, 2 POLE, 10A FOR CONVENIENCE OUTLET WITH AUXILIARY SWITCH, 1NO + 1NC CONTACTS | | 211 | 2 | S202P-K10 S2C-H11L | ABB | 2CDS 252 001 R0427 2CDS 270 1917 R0001 | SWEDEN |
| | | | | | | | | | | | |
| | 20 | | C3 | THERMOSTAT FOR SPACE HEATER, 5-60 ° C | | 211 | 1 | SK 3110 | RITTAL | SK 3110 | |
| C | 21 | U39.5004 | TJ | TELEPHONE JACK 1GANG 4WIRE | | 211 | 1 | EDF410 | EDISON | EDF410 | THIWAN |
| | | | | | | | | | | | |
| | 22 | | C7 | ON/OFF SWITCH FOR SPACE HEATER | | 211 | 1 | M2SS1-10B MCBH-10 | ABB | 1SFA 611 200 R1006 1SFA 611 605 R1101 | SWEDEN |
| | | | | | | | | | | | |
| | 23 | | DS | DOOR SWITCH FOR CONTROL OF CUBICLE INTERNAL ILLUMINATION LAMP | | 211 | 1 | LS30P | ABB | 1SBV 010213 R1202 | SWEDEN |
| | 24 | | IL | INTERNAL ILLUMINATION CUBICLE LAMP SUITABLE FOR 127V AC, 60Hz SUPPLY, 20W | | 211 | 1 | T-4 | SUNON | SP-20W | |
| D | | | | | | | | | | | |
| | 25 | | SH | SPACE HEATER, 150W, 120V, 60Hz | | 211 | 1 | RICA | GRUPPO | 1FZEK 006 C001 | ITALY |
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| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | LIST OF APPARATUS | | الشركة الوطنية لنقل الكهرباء | | نقل الكهرباء National Grid sa |
| | 01 | 13 49 | FACTORY ASBUILT | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-SPARE-2 RELAY PANEL-1+R06.1 | | INDEX | | PLANT NO. |
| | 00 | 13 04 | FOR APPROVAL | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | DRAWING NUMBER | | SHEET NO. |
| | REV. NO. | DATE | DESCRIPTION | | DPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | - C421 | | CD-322920 |
| | | | | | | | | | SHT | | CONT. |
| | | | | | | | | | L04 | | L05 |
| NG/D2-D (2012/01) | | | | | | | | | | | |
| DMS VECTOR NGD200 | | | | | | | | | | | |

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| A | | | | | | | | | | |
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| E | | | | | | | | | | |
| F | | | | | | | | | | |

| LABEL REF. | LABEL ENGRAVING | MATERIALS | ENGRAVING | LABEL SIZE | LETTER SIZE |
|------------|-----------------------|---------------------|--------------------------------------|------------|-------------|
| U05.5001 | U05.5001 87L-1 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U12.5001 | U12.5001 TS-1 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X15mm | 4mm |
| U16.5001 | U16.5001 S86F1 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U16.5002 | U16.5002 S86CBF | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U16.5003 | U16.5003 S86B-1 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U16.5004 | U16.5004 S86B-2 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X10mm | 3mm |
| U16.5005 | U16.5005 LT | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X10mm | 4mm |
| U16.5006 | U16.5006 S01 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U16.5007 | U16.5007 S02 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X10mm | 4mm |
| U16.5008 | U16.5008 L01 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X10mm | 4mm |
| U25.5001 | U25.5001 86F1 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U25.5002 | U25.5002 85R1 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U25.5003 | U25.5003 86CBF | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U25.5004 | U25.5004 86B-1 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U25.5005 | U25.5005 86B-2 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U29.101 | U29.101 74R1/74IT1 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U29.301 | U29.301 74RS/74IS | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U29.107 | U29.107 K01M | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U29.119 | U29.307 TMR/86BF1 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U29.319 | U29.319 TMR/86B-1 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U29.125 | U29.125 TMR/86B-2 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U29.325 | U29.325 R1 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U29.131 | U29.131 R2 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |

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|------------------------------|-------|--------------------------|--|--|--|---------------------------------------|--|--|-----------|----------------|-----------|-------|----------|
| AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | LIST OF APPARATUS | | الشركة الوطنية لنقل الكهرباء نقل الكهرباء National Grid sa | | | | | |
| | | | | DRAWN BY <u> RIZ </u> CHECKED BY <u> KVR </u> | | | | | | | | | |
| 01 | 13 49 | FACTORY ASBUILT | | DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____ | | 132kV UGF-SPARE-2 RELAY PANEL-1+R06.1 | | INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | | REV. NO. |
| 00 | 13 04 | FOR APPROVAL | | OPRG. DEPT. <u> CTPD </u> ENG. DEPT. <u> AUT-PSAC </u> | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | | SHT | CONT. | |
| REV. NO. | DATE | DESCRIPTION | | | | RIYADH SAUDI ARABIA | | - | C421 | CD-322920 | L06 | L07 | 01 |

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| G | | | | | | | | | | |

| LABEL REF. | LABEL ENGRAVING | MATERIALS | ENGRAVING | LABEL SIZE | LETTER SIZE |
|------------|--------------------------|-----------|--------------------------------------|------------|-------------|
| C1 | C1 127V AC SUPPLY MCB | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| C2 | C2 220V AC SUPPLY MCB | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| C3 | C3 THERMOSTAT | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| C7 | C7 ON/OFF SWITCH | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| DS | DS DOOR SWITCH | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| IL | IL ILLUMINATION LAMP | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| SH | SH SPACE HEATER | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U39.5001 | U39.5001 Q1 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U39.5002 | U39.5002 Q2 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U39.5003 | U39.5003 C01/C02 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U39.5004 | U39.5004 TJ | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U36.5001 | U36.5001 Q3 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U36.5002 | U39.5002 Q4 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U36.5003 | U36.5003 Q5 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |

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|-------------------|-------|-----------------|---|--|--------------------------------------|--|
| AS-BUILT BY _____ | | DATE _____ | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | |
| | | | DRAWN BY <u> RIZ </u> CHECKED BY <u> KVR </u> | | | |
| 01 | 13 49 | FACTORY ASBUILT | | | | |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____ | | | |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. <u> CTPD </u> | | ENG. DEPT. <u> AUT-PSAC </u> | |

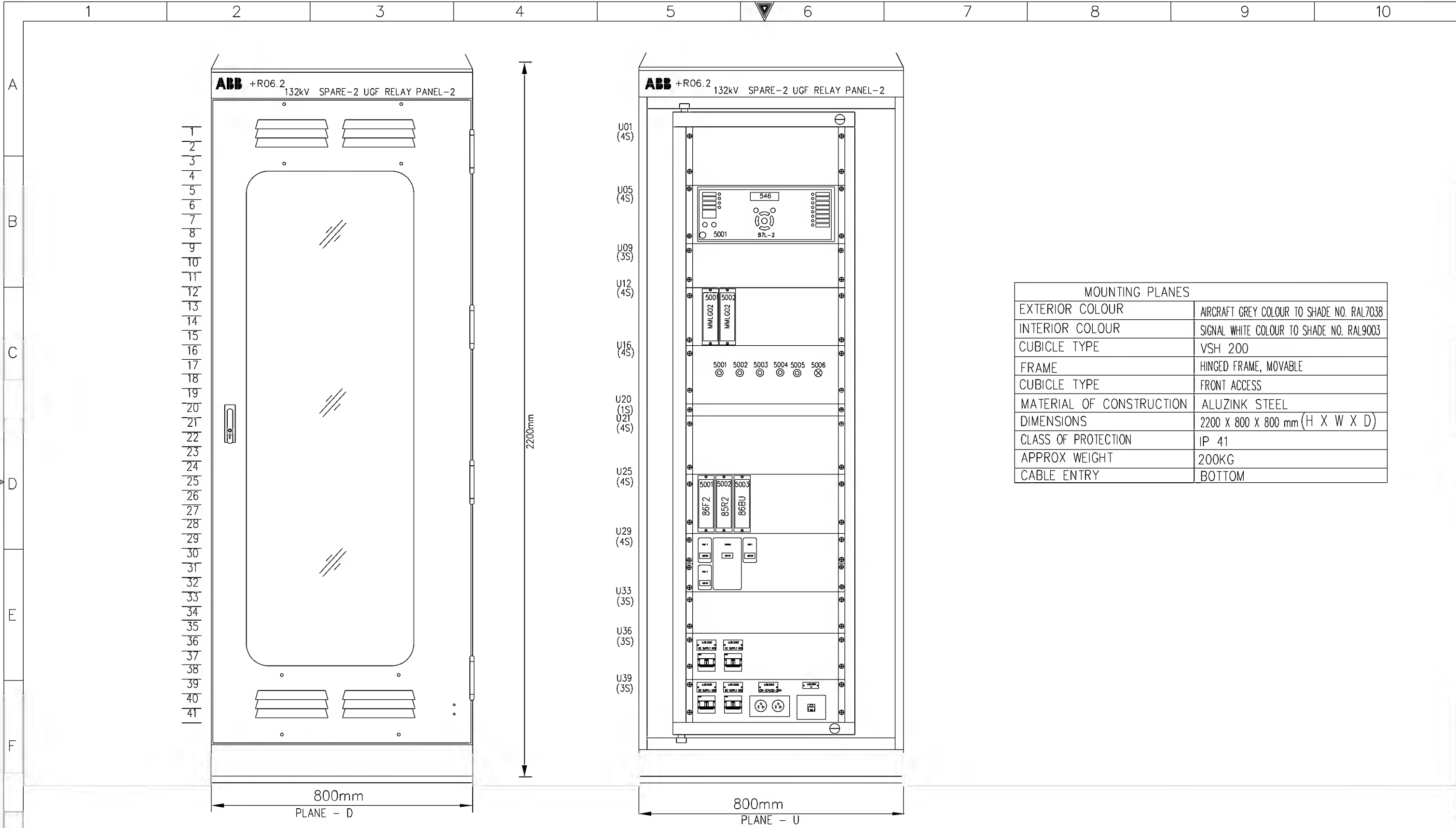
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| LIST OF APPARATUS | |
| 132kV UGF-SPARE-2 RELAY PANEL-1+R06.1 | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | |
| RIYADH SAUDI ARABIA | |

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| الشركة الوطنية لنقل الكهرباء | | نقل الكهرباء | | National Grid sa | |
| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. | |
| - | C421 | CD-322920 | SHT | CONT. | 01 |
| | | | L07 | NIL | |

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| A |  | | POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656 | | | | | ABB AUTOMATION COMPANY LTD., 414, AL-KHARJ ROAD SECOND INDUSTRIAL CITY RIYADH-11383 K.S.A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | CONTRACTOR : ABB Contracting Company | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CLIENT : National Gridsa | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D | PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SUBSTATION : S/S 8709 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E | CONTRACT NO. : 11131113/00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | TITLE : Assembly Drawing +R06.2 [Under Ground Feeder] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G | <table><tr><td colspan="3">AS-BUILT BY _____ DATE _____</td><td colspan="2">CONTRACT NO. 11131113/00</td><td colspan="2">JOB ORDER NO. S-13656</td><td colspan="3">COVER SHEET</td><td colspan="2"> نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa</td></tr><tr><td colspan="2">01</td><td colspan="2">13 49</td><td colspan="2">FACTORY ASBUILT</td><td colspan="2">DRAWN BY RIZ CHECKED BY KVR</td><td colspan="3">132kV UGF-SPARE-2 RELAY PANEL-2+R06.2</td><td colspan="2">INDEX</td></tr><tr><td colspan="2">00</td><td colspan="2">13 04</td><td colspan="2">FOR APPROVAL</td><td colspan="2">DATE STARTED 24.01.2013 DATE COMPLETED _____</td><td colspan="3">S/S 8709-132/13.8KV IN AL-KHARJ CITY</td><td colspan="2">PLANT NO.</td></tr><tr><td colspan="2">REV. NO.</td><td colspan="2">DATE</td><td colspan="2">DESCRIPTION</td><td colspan="2">OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC</td><td colspan="3">RIYADH SAUDI ARABIA</td><td colspan="2">DRAWING NUMBER</td></tr><tr><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="3"></td><td colspan="2">SHEET NO.</td></tr><tr><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="3"></td><td colspan="2">SHT CONT.</td></tr><tr><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="3"></td><td colspan="2">REV. NO.</td></tr><tr><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="3"></td><td colspan="2">01</td></tr><tr><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="3"></td><td colspan="2">G00G01</td></tr></table> | | | | | | | | | | AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | COVER SHEET | | |  نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa | | 01 | | 13 49 | | FACTORY ASBUILT | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-SPARE-2 RELAY PANEL-2+R06.2 | | | INDEX | | 00 | | 13 04 | | FOR APPROVAL | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | PLANT NO. | | REV. NO. | | DATE | | DESCRIPTION | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | | DRAWING NUMBER | | | | | | | | | | | | | SHEET NO. | | | | | | | | | | | | | SHT CONT. | | | | | | | | | | | | | REV. NO. | | | | | | | | | | | | | 01 | | | | | | | | | | | | | G00G01 | |
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | COVER SHEET | | |  نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 01 | | 13 49 | | FACTORY ASBUILT | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-SPARE-2 RELAY PANEL-2+R06.2 | | | INDEX | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 00 | | 13 04 | | FOR APPROVAL | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | PLANT NO. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REV. NO. | | DATE | | DESCRIPTION | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | | DRAWING NUMBER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | SHEET NO. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | SHT CONT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | REV. NO. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | 01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | G00G01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

NG/D2-D (2012/01)

DMS VECTOR NGD200



| MOUNTING PLANES | |
|--------------------------|---|
| EXTERIOR COLOUR | AIRCRAFT GREY COLOUR TO SHADE NO. RAL7038 |
| INTERIOR COLOUR | SIGNAL WHITE COLOUR TO SHADE NO. RAL9003 |
| CUBICLE TYPE | VSH 200 |
| FRAME | HINGED FRAME, MOVABLE |
| CUBICLE TYPE | FRONT ACCESS |
| MATERIAL OF CONSTRUCTION | ALUZINK STEEL |
| DIMENSIONS | 2200 X 800 X 800 mm (H X W X D) |
| CLASS OF PROTECTION | IP 41 |
| APPROX WEIGHT | 200KG |
| CABLE ENTRY | BOTTOM |

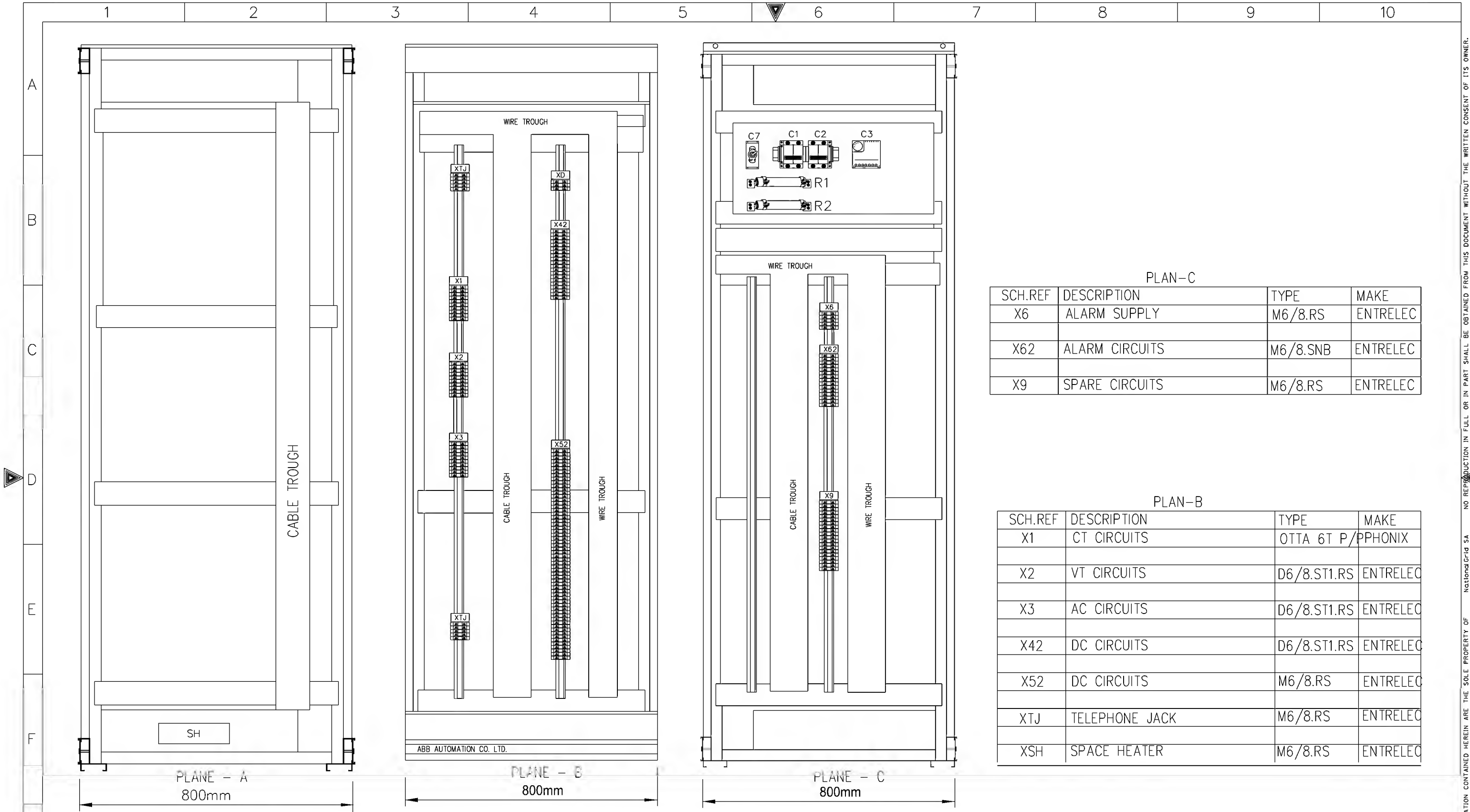
| | | | | | | | | | | |
|---|--|--|---|--|--|--|---------------------------------------|--|--|--|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | ASSEMBLY DRAWING | | الشركة الوطنية لنقل الكهرباء National Grid sa | |
| DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u> | | | DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____ | | OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u> | | 132kV UGF-SPARE-2 RELAY PANEL-2+R06.2 | | | |
| FACTORY ASBUILT | | | DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____ | | OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u> | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | INDEX | |
| FOR APPROVAL | | | DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____ | | OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u> | | RIYADH SAUDI ARABIA | | PLANT NO. | |
| DESCRIPTION | | | DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____ | | OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u> | | CD-322921 | | DRAWING NUMBER | |
| REV. NO. | | | DATE | | DESCRIPTION | | SHEET NO. | | REV. NO. | |
| 01 | | | 13 49 | | FACTORY ASBUILT | | SHT | | CONT. | |
| 00 | | | 13 04 | | FOR APPROVAL | | G01 | | G02 | |
| | | | | | | | | | 01 | |

NG/D2-D (2012/01

NGD200

DMS

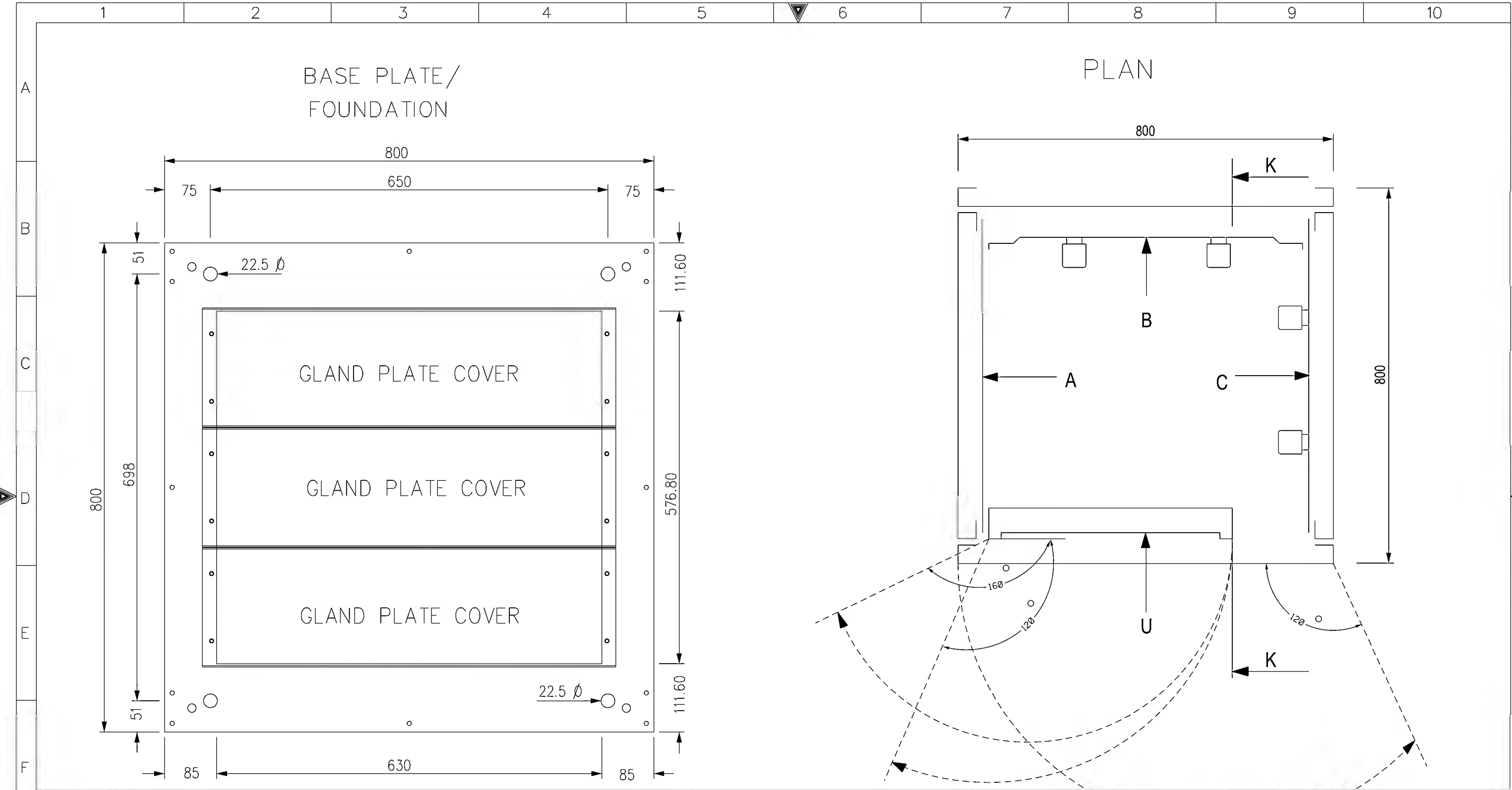
VECTOR



| PLAN-C | | | |
|---------|----------------|----------|----------|
| SCH.REF | DESCRIPTION | TYPE | MAKE |
| X6 | ALARM SUPPLY | M6/8.RS | ENTRELEC |
| X62 | ALARM CIRCUITS | M6/8.SNB | ENTRELEC |
| X9 | SPARE CIRCUITS | M6/8.RS | ENTRELEC |

| PLAN-B | | | |
|---------|----------------|-------------------|----------|
| SCH.REF | DESCRIPTION | TYPE | MAKE |
| X1 | CT CIRCUITS | OTTA 6T P/PPHONIX | |
| X2 | VT CIRCUITS | D6/8.ST1.RS | ENTRELEC |
| X3 | AC CIRCUITS | D6/8.ST1.RS | ENTRELEC |
| X42 | DC CIRCUITS | D6/8.ST1.RS | ENTRELEC |
| X52 | DC CIRCUITS | M6/8.RS | ENTRELEC |
| XTJ | TELEPHONE JACK | M6/8.RS | ENTRELEC |
| XSH | SPACE HEATER | M6/8.RS | ENTRELEC |

| | | | | | | | | | | |
|------------------------------|--|--|--|--|---------------------------------------|--|--------------------------------------|--|---|--|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | ASSEMBLY DRAWING | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div> | |
| 13 49 | | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-SPARE-2 RELAY PANEL-2+R06.2 | | | | | |
| 13 04 | | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | INDEX | | PLANT NO. | |
| REV. NO. | | | DATE | | DESCRIPTION | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | DRAWING NUMBER | |
| | | | | | | | RIYADH SAUDI ARABIA | | SHEET NO. | |
| | | | | | | | | | REV. NO. | |
| | | | | | | | | | 01 | |
| | | | | | | | | | G02 G03 | |
| | | | | | | | | | NG/D2-D (2012/01) | |
| | | | | | | | | | DMS VECTOR NGD200 | |



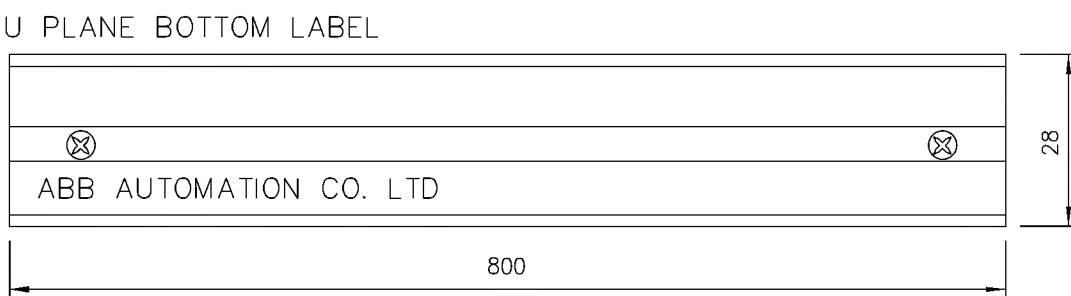
AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

| | | |
|----------|-------|-----------------|
| Ø1 | 13 49 | FACTORY ASBUILT |
| Ø0 | 13 04 | FOR APPROVAL |
| REV. NO. | DATE | DESCRIPTION |

| | | | |
|--------------|------------|----------------|----------|
| DRAWN BY | RIZ | CHECKED BY | KVR |
| DATE STARTED | 24.01.2013 | DATE COMPLETED | |
| OPRG. DEPT. | CTPD | ENG. DEPT. | AUT-PSAC |

ASSEMBLY DRAWING
132kV UGF-SPARE-2 RELAY PANEL-2+R06.2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

| | | | | | |
|------------------------------|-----------|----------------|---|-------|----------|
| الشركة الوطنية لنقل الكهرباء | | |  نقل الكهرباء National Grid SA | | |
| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | | REV. NO. |
| - | C421 | CD-322921 | SHT | CONT. | 01 |
| | | | G03 | G04 | |



MANUFACTURING LABEL



ABB Automation Co.Ltd.

| | |
|----------------------|------------------------------|
| PROJECT : | National Grid SA S/S 8709 |
| ORDER REFERENCE : | 2875 RF S13656 |
| YEAR OF MANUFACTURE: | 2013 |
| PANEL NO. : | +R06.2 |
| DRAWING NO. : | S13656-CD-323922 |

MADE IN THE KINGDOM OF SAUDI ARABIA

| | | | |
|------------------------------|-------|--------------------------|---|
| AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656 |
| Ø1 | 13 49 | FACTORY ASBUILT | DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u> |
| ØØ | 13 04 | FOR APPROVAL | DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____ |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u> |

ASSEMBLY DRAWING

132kV UGF-SPARE-2 RELAY PANEL-2+R06.2

| |
|--------------------------------------|
| S/S 8709-132/13.8KV IN AL-KHARJ CITY |
|--------------------------------------|

RIYADH

SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



نقل الكهرباء

National Grid SA





| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | | REV. NO. |
|-------|-----------|----------------|-----------|-------|----------|
| - | C421 | CD-322921 | SHT | CONT. | 01 |
| | | | G04 | 00 | |

NG/D2-D (2012/01)

DMS

VECTOR

NGD200

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|--|-----------------|---|---|-----------------------|----------------------|-------------|--|---------------------------------------|---|------------------------------|-----------|----------|--------------------------|--|-----------------------|--|-------------|--|--|---|--|----|-------|-----------------|--------------|--|--|----------------|--|--|---------------------------------------|--|--|----|-------|--------------|-------------------------|--|--|----------------------|--|--|--------------------------------------|--|--|----------|------|-------------|------------------|--|--|---------------------|--|--|---------------------|--|--|--|--|--|--|--|--|--|--|--|-------|-----------|----------------|-----------|----------|--|--|--|--|--|--|--|--|--|---|------|-----------|--------|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A |  | | POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656 | | | | | ABB AUTOMATION COMPANY LTD., 414, AL-KHARJ ROAD SECOND INDUSTRIAL CITY RIYADH-11383 K.S.A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | CONTRACTOR : ABB Contracting Company | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CLIENT : National Gridsa | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D | PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SUBSTATION : S/S 8709 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E | CONTRACT NO. : 11131113/00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | TITLE : LIST OF APPARATUS +R06.2 [Under Ground Feeder] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G | <table><tr><td colspan="3">AS-BUILT BY _____ DATE _____</td><td colspan="2">CONTRACT NO. 11131113/00</td><td colspan="2">JOB ORDER NO. S-13656</td><td colspan="3">COVER SHEET</td><td colspan="2"> نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa</td></tr><tr><td>01</td><td>13 49</td><td>FACTORY ASBUILT</td><td colspan="3">DRAWN BY RIZ</td><td colspan="3">CHECKED BY KVR</td><td colspan="3">132kV UGF-SPARE-2 RELAY PANEL-2+R06.2</td></tr><tr><td>00</td><td>13 04</td><td>FOR APPROVAL</td><td colspan="3">DATE STARTED 24.01.2013</td><td colspan="3">DATE COMPLETED _____</td><td colspan="3">S/S 8709-132/13.8KV IN AL-KHARJ CITY</td></tr><tr><td>REV. NO.</td><td>DATE</td><td>DESCRIPTION</td><td colspan="3">OPRG. DEPT. CTPD</td><td colspan="3">ENG. DEPT. AUT-PSAC</td><td colspan="3">RIYADH SAUDI ARABIA</td></tr><tr><td colspan="3"></td><td colspan="3"></td><td colspan="3"></td><td>INDEX</td><td>PLANT NO.</td><td>DRAWING NUMBER</td><td>SHEET NO.</td><td>REV. NO.</td></tr><tr><td colspan="3"></td><td colspan="3"></td><td colspan="3"></td><td>-</td><td>C421</td><td>CD-322921</td><td>L00L01</td><td>01</td></tr></table> | | | | | | | | | | AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | COVER SHEET | | |  نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa | | 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | | | CHECKED BY KVR | | | 132kV UGF-SPARE-2 RELAY PANEL-2+R06.2 | | | 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | | | DATE COMPLETED _____ | | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | | | ENG. DEPT. AUT-PSAC | | | RIYADH SAUDI ARABIA | | | | | | | | | | | | INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. | | | | | | | | | | - | C421 | CD-322921 | L00L01 | 01 |
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | COVER SHEET | | |  نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | | | CHECKED BY KVR | | | 132kV UGF-SPARE-2 RELAY PANEL-2+R06.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | | | DATE COMPLETED _____ | | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | | | ENG. DEPT. AUT-PSAC | | | RIYADH SAUDI ARABIA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | - | C421 | CD-322921 | L00L01 | 01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

NG/D2-D (2012/01)

DMS VECTOR NGD200

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|------------------------------|----------|--------------------------|--|--|---|---------------------------------------|-----|------|----------------------------------|------------------------------|--|-----------|-------------------|----------------------------------|---|-----------|-------------------|----------|-----|--|--------|--|--------|--|
| 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | | 10 | | | | | | | |
| A | SR. NO. | LOC. REF | SCH. REF. | D E S C R I P T I O N | | | | SHT | QTY. | TYPE | MAKE | ORD INFORMATION | | COUNRTY OF ORIGIN | | | | | | | | | | | |
| | | | | RELAY CUBICLE- +R06.2 ACCOMODATING THE FOLLOWING | | | | | 1 | | | | | | | | | | | | | | | | |
| | 1 | U05.5001 | 87L-2 | NUMERICAL HIGH SPEED CURRENT DISTANCE PROTECTION VERSION : 1 & 3 POLE TRIPPING/RECLOSING MHO/QUAD CHAR AUX : 110V-250V DC : 100-120V In/Vn : DUAL RATED CT (1/5A) HARDWARE : EHETHER NET (100mbits) PLUS irig-b modulated PRODUCT OPTION : CH1-1300nm SINGLE MODE CH2-1300nm SINGLE MODE PROTOCOL OPTION : IEC61850+COURIER VIA REAR RS485 PORT MOUNTING : 19" RACK,2A LOGICAL INPUTS,32 RELAY OUT PUTS LANGUAGE : ENGLISH SOFTWARE : 71 | | | | 498 | 1 | P546 | ALSTOM | P54631NK6M0710M | | UK | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | 2 | U12.5001 | TS-1 | TEST SWITCH FOR P546 RELAY | | | | 422 | 2 | MMLG02 | ALSTOM | MMLG02 R1AA 0001E | | UK | | | | | | | | | | | |
| | | U12.5002 | TS-2 | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3 | U16.5001 | S03 | PUSH BUTTON FOR FPSM IN SELECTION BUTTON COLOUR : BLACK CONTACT DATA : 1NO + 1NC | | | | 432 | 1 | MP1-10B MCBH-20 | ABB | 1SFA 611 100 R1006 1SFA 611 605 R1102 | | SWEDEN | | | | | | | | | | | |
| D | 4 | U16.5002 | S04 | PUSH BUTTON FOR FPSM OUT SELECTION BUTTON COLOUR : BLACK CONTACT DATA : 1NO + 1NC | | | | 432 | 1 | MP1-10B MCBH-20 | ABB | 1SFA 611 100 R1006 1SFA 611 605 R1102 | | SWEDEN | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 5 | U16.5003 | S86BU | PUSH BUTTON FOR 86BU RESET BUTTON COLOUR : BLACK CONTACT DATA : 1NO + 1NC | | | | 443 | 1 | MP1-10B MCBH-20 | ABB | 1SFA 611 100 R1006 1SFA 611 605 R1102 | | SWEDEN | | | | | | | | | | | |
| E | 6 | U16.5004 | S86F2 | PUSH BUTTON FOR 86F2 RESET BUTTON COLOUR : BLACK CONTACT DATA : 1NO + 1NC | | | | 432 | 1 | MP1-10B MCBH-20 | ABB | 1SFA 611 100 R1006 1SFA 611 605 R1102 | | SWEDEN | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 7 | U16.5005 | LT | PUSH BUTTON FOR 86F2 RESET BUTTON COLOUR : BLACK CONTACT DATA : 1NO + 1NC | | | | 431 | 1 | MP1-10B MCBH-20 | ABB | 1SFA 611 100 R1006 1SFA 611 605 R1102 | | SWEDEN | | | | | | | | | | | |
| F | 8 | U16.5006 | L01 | INDICATION LAMP OUT LENS : WHITE LENS RATING 110-130V,4-6MA HOLDER RATING :130V WITH RESISTORS DIODE BLOCK | | | | 431 | 1 | MC1-100W MCBH-003 KA2-2145 | ABB | 1SFA 611 400 R1003 1SFA 611 605 R1400 1SFA 616 921 R2145 | | SWEDEN | | | | | | | | | | | |
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| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | COVER SHEET | | | | الشركة الوطنية لنقل الكهرباء | | | | نقل الكهرباء National Grid sa | | | | | | | | | | |
| | 01 | 13 49 | FACTORY ASBUILT | | DRAWN BY RIZ CHECKED BY KVR | | 132kv UGF-SPARE-2 RELAY PANEL-2+R06.2 | | | | INDEX | | PLANT NO. | | DRAWING NUMBER | | SHEET NO. | | REV. NO. | | | | | | |
| | 00 | 13 04 | FOR APPROVAL | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | | | | | | | SHT | | CONT. | | | | | | |
| | REV. NO. | DATE | DESCRIPTION | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | | | - | | C421 | | CD-322921 | | L01 | | L02 | | | | | | |
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| | 15 | | | MCB 2 POLE 6A, FOR DC SUPPLY WITH 2NC AUXILIARY CONTACT | 416 | 4 | S 282 UC-K6 S2-H02 | ABB | GH S282 0164 R0377 GH S270 1916 R0003 | GERMANY |
| | | U39.5001 | Q1 | Q1 R2± SUPPLY | | | | | | |
| | | U39.5002 | Q2 | Q2 R3 ± SUPPLY | | | | | | |
| | | U36.5001 | Q3 | Q3 IT2+ SUPPLY | | | | | | |
| | | U36.5002 | Q4 | Q4 TC2 + SUPPLY | | | | | | |
| B | | | | | | | | | | FRANCE |
| | 16 | U39.5003 | C01 | CONVENIENCE OUTLET 10A, 127V AC | 411 | 1 | USM45 & USMS45 | LEGRAND | 74140 & 74180 | |
| | | | C02 | CONVENIENCE OUTLET 10A, 220V AC | | | | | | |
| | | | C1,C2 | MINIATURE CIRCUIT BREAKER, 2 POLE, 10A FOR CONVENIENCE OUTLET WITH AUXILIARY SWITCH, 1NO + 1NC CONTACTS | 411 | 2 | S202P-K10 S2C-H11L | ABB | 2CDS 253 001 R0104 2CDS 200 936 R0001 | GERMANY |
| | 17 | | C3 | THERMOSTAT FOR SPACE HEATER, 5-60° C | 411 | 1 | SK 3110 | RITTAL | SK 3110 | THIWAN |
| | 18 | U39.5004 | TJ | TELEPHONE JACK 1GANG 4WIRE | 411 | 1 | EDF410 | EDISON | EDF410 | SWEDEN |
| C | | | | | | | | | | |
| | 19 | | C7 | ON/OFF SWITCH FOR SPACE HEATER | 411 | 1 | M2SS1-10B MCBH-10 | ABB | 1SFA 611 200 R1006 1SFA 611 605 R1101 | |
| | 20 | | DS | DOOR SWITCH FOR CONTROL OF CUBICLE INTERNAL ILLUMINATION LAMP | 411 | 1 | LS30PKB1302 | ABB | 1SBV 010213 R1202 | SWEDEN |
| | 21 | | IL | INTERNAL ILLUMINATION CUBICLE LAMP SUITABLE FOR 127V AC, 60Hz SUPPLY, 20W | 411 | 1 | T-4 | SUNON | SP-20W | |
| | 22 | | SH | SPACE HEATER, 150W, 120V, 60Hz | 411 | 1 | RICA | GRUPPO | 1FZEK 006 C001 | ITALY |
| D | | | | | | | | | | |
| | 23 | | R1 | FIXED RESISTOR FOR TRIP CIRCUIT SUPERVISION CKT. | 491 | 2 | GRF 30/200 | DANOTHERM | GRF 30/200 | GERMANY |
| | | | R2 | 2.5Kohm,15W | | | | | | |
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| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656 | LIST OF APPARATUS | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div> | | | | |
| | 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ CHECKED BY KVR | 132kV UGF-SPARE-2 RELAY PANEL-2+R06.2 | | INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
| | 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 DATE COMPLETED _____ | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | | SHT CONT. | |
| | REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | RIYADH SAUDI ARABIA | | - | C421 | CD-322921 | L04 L05 | 01 |

NG/D2-D (2012/01)

DMS VECTOR

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| SR. NO. | ITEM DESIGNATION | D E S C R I P T I O N | SHEET.NO. | QTY. | TYPE | MAKE | ORDERING INFORMATION | COUNTRY OF ORIGIN |
|---------|------------------|--|-----------|------|-----------------------------|--------------------------|-------------------------------|-------------------|
| 24 | X1 | BOLT CONNECTING TERMINAL BLOCKS FOR DISCONNECTABLE CT CIRCUITS | 501 | 10 | OTTA 6T P/P | PHOENIX | 0790462 | GERMANY |
| | X2 | SPRING LOADED TERMINAL BLOCKS FOR DISCONNECTABLE VT CIRCUITS | 501 | 5 | D6/8.ST1.RS | ENTRELEC | 1SNA 115 831 R0400 | FRANCE |
| | X3 | SPRING LOADED TERMINAL BLOCKS FOR DISCONNECTABLE AC CIRCUITS | 501 | 10 | D6/8.ST1.RS | ENTRELEC | 1SNA 115 831 R0400 | FRANCE |
| | X42 | SPRING LOADED TERMINAL BLOCK FOR DISCONNECTABLE DC CIRCUITS | 501 | 50 | D6/8.ST1.RS | ENTRELEC | 1SNA 115 831 R0400 | FRANCE |
| | X52 | SPRING LOADED TERMINAL BLOCK FOR DC PROTN. CIRCUITS | 501 | 50 | M6/8.RS | ENTRELEC | 1SNA 115 688 R2500 | FRANCE |
| | X62,X6 | KNIFE TYPE TERMINAL BLOCKS FOR COMMON ALARM CIRCUITS | 501 | 15,5 | M6/8.SNB | ENTRELEC | 1SNA 115 685 R1200 | FRANCE |
| | X9 | SPRING LOADED TERMINAL BLOCKS FOR SPARE CIRCITS | 501 | 15 | M6/8.RS | ENTRELEC | 1SNA 115 688 R2500 | FRANCE |
| | XTJ | SPRING LOADED TERMINAL BLOCKS FOR TELEPHONE JACK | 501 | 5 | M6/8.RS | ENTRELEC | 1SNA 115 688 R2500 | FRANCE |
| | XSH | SPRING LOADED TERMINAL BLOCKS FOR SPACE HEATER | 501 | 3 | M6/8.RS | ENTRELEC | 1SNA 115 688 R2500 | FRANCE |
| | XD | TERMINAL BLOCKS WITH BLOCKING DIODE | 501 | 3 | M4/6.S IN5408 V150ZA1 | ENTRELEC MEJDAF RS | 11521310 02-049 239-270 | FRANCE |
| | X6 | SPRING LOADED TERMINAL BLOCKS FOR ALARM CIRCITS | 501 | 5 | M6/8.RS | ENTRELEC | 1SNA 115 688 R2500 | FRANCE |

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|---|------------------------------|-------|--------------------------|--|---------------------------------------|--|---|-----------|----------------|-------------------|----------|
| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656 | LIST OF APPARATUS | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div> | | | | |
| | 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ CHECKED BY KVR | 132kV UGF-SPARE-2 RELAY PANEL-2+R06.2 | | INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
| | 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 DATE COMPLETED _____ | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | - | C421 | CD-322921 | SHT L05 CONT. L06 | 01 |
| | REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | RIYADH SAUDI ARABIA | | | | | | |

NG/D2-D (2012/01)

DMS VECTOR

NGD200

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| LABEL REF. | LABEL ENGRAVING | MATERIALS | ENGRAVING | LABEL SIZE | LETTER SIZE |
|------------|----------------------|---------------------|--------------------------------------|------------|-------------|
| U05.5001 | U05.5001 87L-2 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U12.5001 | U12.5001 TS-1 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X15mm | 4mm |
| U12.5002 | U12.5002 TS-2 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X15mm | 4mm |
| U16.5001 | U16.5001 S03 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U16.5002 | U16.5002 S04 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U16.5003 | U16.5003 S86BU | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U16.5004 | U16.5004 S86F2 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X10mm | 3mm |
| U16.5005 | U16.5005 LT | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X10mm | 4mm |
| U16.5006 | U16.5006 L01 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X10mm | 4mm |
| U25.5001 | U25.5001 86F2 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X10mm | 4mm |
| U25.5002 | U25.5002 85R2 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X10mm | 4mm |
| U25.5003 | U25.5003 86BU | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X10mm | 4mm |
| U29.101 | U29.101 74R2/74R3 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U29.107 | U29.107 K01S | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U29.301 | U29.301 TMR/86F2 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U29.125 | U29.125 74IT2 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U29.119 | U29.119 R1 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U29.319 | U29.319 R2 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |

AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

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| 01 | 13 49 | FACTORY ASBUILT |
| 00 | 13 04 | FOR APPROVAL |
| REV. NO. | DATE | DESCRIPTION |

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| DRAWN BY RIZ | CHECKED BY KVR |
| DATE STARTED 24.01.2013 | DATE COMPLETED |
| OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC |

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| LIST OF APPARATUS | |
| 132kV UGF-SPARE-2 RELAY PANEL-2+R06.2 | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | |
| RIYADH SAUDI ARABIA | |

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| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. | |
| - | C421 | CD-322921 | L06 | L07 | 01 |


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| LABEL REF. | LABEL ENGRAVING | MATERIALS | ENGRAVING | LABEL SIZE | LETTER SIZE |
|------------|--------------------------|-----------|--------------------------------------|------------|-------------|
| C1 | C1 127V AC SUPPLY MCB | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| C2 | C2 220V AC SUPPLY MCB | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| C3 | C3 THERMOSTAT | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| C7 | C7 ON/OFF SWITCH | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| DS | DS DOOR SWITCH | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| IL | IL ILLUMINATION LAMP | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| SH | SH SPACE HEATER | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U39.5001 | U39.5001 Q1 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U39.5002 | U39.5002 Q2 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U39.5003 | U39.5003 C01/C02 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U39.5004 | U39.5004 TJ | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U36.5001 | U36.5001 Q3 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U36.5002 | U39.5002 Q4 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
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| AS-BUILT BY _____ | | DATE _____ | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | |
| | | | DRAWN BY _____ RIZ _____ CHECKED BY _____ KVR _____ | | | |
| 01 | 13 49 | FACTORY ASBUILT | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | |
| 00 | 13 04 | FOR APPROVAL | | OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC _____ | | |
| REV. NO. | DATE | DESCRIPTION | | | | |

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| LIST OF APPARATUS | |
| 132kV UGF-SPARE-2 RELAY PANEL-2+R06.2 | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | |
| RIYADH SAUDI ARABIA | |

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| INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
| - | C421 | CD-322921 | | SHT | CONT. | 01 |
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| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| A |  | | POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656 | | | | | ABB AUTOMATION COMPANY LTD. 414, AL-KHARJ ROAD SECOND INDUSTRIAL CITY RIYADH-11383 K.S.A | | |
| B | | | | | | | | | | |
| C | CONTRACTOR : ABB Contracting Company | | | | | | | | | |
| | CLIENT : National Gridsa | | | | | | | | | |
| D | PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY | | | | | | | | | |
| | SUBSTATION : S/S 8709 | | | | | | | | | |
| E | CONTRACT NO. : 11131113/00 | | | | | | | | | |
| | TITLE : SCHEMATICS DRAWINGS (Under Ground Feeder) | | | | | | | | | |
| F | | | | | | | | | | |

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| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | COVER SHEET | |  نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa | | | | | | | |
| | | | DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u> | | | | 132kV UGF-SPARE-2 RELAY PANEL-1/2 | | INDEX | | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
| | 01 13 49 | | FACTORY ASBUILT | | DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | - | | C421 | CD-322922 | | SHT 000 CONT. 001 | | 01 |
| | 00 13 04 | | FOR APPROVAL | | OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u> | | RIYADH SAUDI ARABIA | | | | | | | | | |
| REV. NO. | | DATE | | DESCRIPTION | | | | | | | | | | | | |

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| CONTENTS | ABB SHT.NO. | REV.00 | REV.01 | REV.02 |
| AC SUPPLY FOR ILLUMINATION & POWER SOCKET | 411 | X | X | |
| AC MCB AUX CONTACTS | 412 | X | X | |
| AC MCB AUX CONTACTS | 416 | X | X | |
| CURRENT TRANSFORMER INPUTS –87L–2 | 421 | X | X | |
| VOLTAGE TRANSFORMER INPUTS – 87L–2 | 422 | X | X | |
| COMMUNICATION CIRCUIT – 87L2 | 423 | X | X | |
| MAIN–2 PROT. 87L–2 RELAY BINARY INPUTS | 431 | X | X | |
| MAIN–2 DIFF. PROTECTION TRIP RELAY CKT. | 432 | X | X | |
| MAIN–2 INTERTRIP RELAY CKT. | 433 | X | X | |
| BACKUP PROTECTION TRIP RELAY CIRCUIT | 443 | X | X | |
| OPTICAL / ELECTRICAL INTERFACE | 446 | X | X | |
| MAIN–2 INDICATION CKT. | 478 | X | X | |
| TRIP COIL–2 SUPERVISION CIRCUIT | 491 | X | X | |
| TRIP COIL–1 & CBF INITIATION CONTACTS | 492 | X | X | |
| CLOSING CIRCUIT | 493 | X | X | |
| COMMON ALARM CIRCUITS | 494 | X | X | |
| SPARE CONTACTS | 495 | X | X | |
| BLOCK REFERENCE–87L–2 | 498 | X | X | |
| BLOCK REFERENCE–87L–2 | 499 | X | X | |
| TERMINAL BLOCKS REFERENCE +R06.2 | 501 | X | X | |
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| SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION |
|--------|--|--------|---|--------|--|
| | FUSE / LINK | | WATTMETER | | ELEMENT WITH NEGATED INHIBITING INPUT |
| | FUSE WITH THE SUPPLY SIDE INDICATED | | VARMETER | | ELEMENT WITH INPUT WHICH DOES NOT CARRY ANY LOGIC INFORMATION |
| | SINGLE-PHASE TRANSFORMER WITH TWO SEPARATE WINDINGS (TWO ALTERNATIVE FORMS) | | POWER FACTOR METER | | ELEMENT WITH POSTPONED OUTPUT |
| | SINGLE-PHASE TRANSFORMER WITH THREE SEPARATE WINDINGS (TWO ALTERNATIVE FORMS) | | POSITION INDICATOR | | AND-ELEMENT WITH TWO INPUTS |
| | SINGLE-PHASE TRANSFORMER WITH FERRO MAGNETIC CORE | | SYNCHROSCOPE | | OR-ELEMENT WITH TWO INPUTS |
| | SINGLE-PHASE VOLTAGE TRANSFORMER (MULTI-LINE AND SINGLE-LINE REPRESENTATION) | | RECORDING VOLTMETER | | LOGIC THRESHOLD ELEMENT WITH FOUR INPUTS AND THRESHOLD VALUE 2 |
| | SINGLE-PHASE VOLTAGE TRANSFORMER WITH TWO SECONDARY WINDINGS (MULTI-LINE AND SINGLE-LINE REPRESENTATION) | | RECORDING WATTMETER | | ELEMENT WITH THREE INPUTS FOR "2 AND ONLY 2" |
| | CURRENT TRANSFORMER (MULTI-LINE AND SINGLE-LINE REPRESENTATION) | | HOUR METER | | EXCLUSIVE OR-ELEMENT WITH THREE INPUTS |
| | CURRENT TRANSFORMER WITH TWO CORES (MULTI-LINE AND SINGLE-LINE REPRESENTATION) | | WATT-HOUR METER | | LOGIC IDENTITY ELEMENT WITH THREE INPUTS |
| | CURRENT TRANSFORMER WITH TWO SECONDARY WINDINGS ON ONE CORE (MULTI-LINE AND SINGLE-LINE REPRESENTATION) | | WATT-HOUR METER FOR ENERGY FROM A BUSBAR SYSTEM | | MAJORITY ELEMENT WITH THREE INPUTS |
| | FILTER | | ELEMENT WITH STATIC INPUT | | NEGATOR |
| | HIGH-PASS FILTER | | ELEMENT WITH STATIC NEGATED INPUT | | NAND ELEMENT WITH TWO INPUTS |
| | BAND-PASS FILTER | | ELEMENT WITH STATIC NEGATED OUTPUT | | NOR ELEMENT WITH TWO INPUTS |
| | VOLTMETER | | ELEMENT WITH DYNAMIC INPUT | | BISTABLE ELEMENT |
| | AMMETER | | ELEMENT WITH DYNAMIC NEGATED INPUT | | |
| | | | ELEMENT WITH INHIBITING INPUT | | |

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| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | |  نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa | | | | | | | | |
| G | 01 | 13 49 | FACTORY ASBUILT | | DRAWN BY _____ RIZ _____ CHECKED BY _____ KVR | | GRAPHICAL SYMBOLS FOR DIAGRAMS | | | | | | | | |
| | 00 | 13 04 | FOR APPROVAL | | DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____ | | 132kV UGF-SPARE-2 RELAY PANEL-1/2 | | | | | | | | |
| | REV. NO. | DATE | DESCRIPTION | | OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u> | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | | | | | |
| | | | | | | | RIYADH SAUDI ARABIA | | INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
| | | | | | | | | | - | C421 | CD-322922 | | SHT | CONT. | 01 |
| | | | | | | | | | NG/D2-D (2012/01 NGD200 | | | | | | |

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LEGENDS

±R1

±R2

±R3

±IT

FL

BB RS±

BB CBF±/CBF±

DC SUPPLY – MAIN PROTECTION

DC SUPPLY – SECONDARY PROTECTION

DC SUPPLY – BACK UP PROTECTION

DC SUPPLY – INTER TRIP

DC SUPPLY – FLASHING CIRCUIT

DC SUPPLY – BUS BAR – PROTECTION RESET

DC SUPPLY – CBF PROTECTION

R

CR

ECC

LOCAL

REMOTE

RESET BUS – ALARM SYSTEM

CONTROL ROOM

ENERGY CONTROL CENTRE

THE LOCATION OF CONTROLLED DEVICE

ANY OTHER LOCATION NOT LOCAL

ON

OFF

A

T

S

CS

CT

LS

LT

LC

LO

RO

OP

RE

CB NORMALLY OPEN AUXILIARY CONTACT

CB NORMALLY CLOSED AUXILIARY CONTACT

COMMON

TEST POSITION

SERVICE POSITION

CLOSE IN SERVICE POSITION

CLOSE IN TEST POSITION

LOCAL SERVICE

LOCAL TEST

LOCAL CLOSE

LOCAL OPEN

REMOTE OPEN

OPERATE

RESET

NOTES

LABELS

WHITE LABEL WITH BLACK LETTERING WILL BE PROVIDED FOR ALL MOUNTED APPARATUS EQUIPMENT IDENTIFICATION AND FUNCTION REFERENCE LABEL WILL BE PROVIDED FOR FRONT MOUNTED EQUIPMENTS OF THE PANEL AND EQUIPMENT IDENTIFICATION LABEL WILL BE PROVIDED FOR INTERNALLY MOUNTED EQUIPMENTS

WIRING

PVC INSULATED 600V GRADE

2.5 SQ.mm. YELLOW COLOURED FOR CT CIRCUITS

2.5 SQ.mm. RE COLOURED FOR VT CIRCUITS

1.5 SQ.mm. GREY COLOURED FOR DC SUPPLY, SCADA AND CONTROL CIRCUITS

2.5 SQ.mm. BLACK COLOURED FOR AVC AND AC CIRCUITS

2.5 SQ.mm. YELLOW/GREEN COLOURED FOR EARTHING CONNECTIONS

FOLLOWING MARKERS SHALL BE PROVIDED ON FOLLOWING WIRES:

+ SIGN FOR DC + WIRE

– SIGN FOR DC – WIRE

LUGS

A. CT CIRCUITS– RING TYPE

B. OTHER CIRCUITS – SPADE TYPE

FERULLING

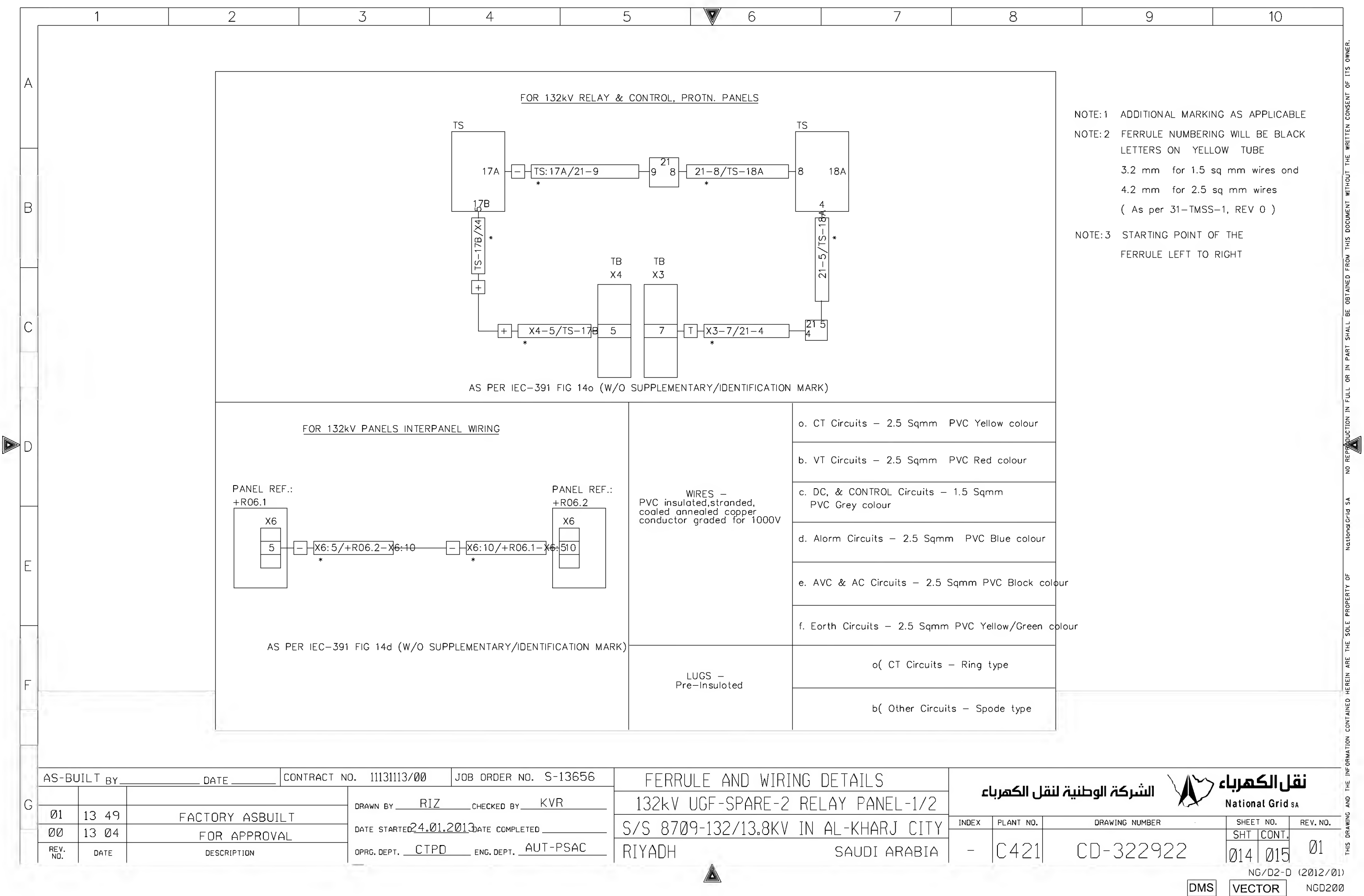
YELLO TUBE 3.2 mm FOR 1.5SQ mm WIRES AND 4.2 FOR 2.5 SQ mm WIRES (AS PER 31 – TMSS–1, RE.0)

| | | | | | | | | | | | | |
|------------------------------|--|--|--------------------------|--|--|--|--------------------------------------|--|--|---|--|--|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | COMMON LEGEND | | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div> | | |
| 01 13 49 | | | FACTORY ASBUILT | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-SPARE-2 RELAY PANEL-1/2 | | | INDEX | | |
| 00 13 04 | | | FOR APPROVAL | | DATE STARTED 24.01.2013 DATE COMPLETED | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | PLANT NO. | | |
| REV. NO. DATE | | | DESCRIPTION | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | | DRAWING NUMBER | | |
| | | | | | | | | | | SHEET NO. | | |
| | | | | | | | | | | REV. NO. | | |
| | | | | | | | | | | SHT CONT. | | |
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NG/D2-D (2012/01)

DMS VECTOR

NGD200



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| G | | | | | | | | | | |

| MANUFACTURER | SCHEMATICS DWG.NO | PANEL DESCRIPTION | PANEL REFERENCE |
|--|-------------------|---|-----------------|
|  PROTECTION & SUBSTATION AUTOMATION | | SS 8709 132kV RELAY PANELS | |
| | CD-322928 | 132/13.8kV GT-1 RELAY PANEL -1 | +R05.1 |
| | | 132/13.8kV GT-1 RELAY PANEL -2 | +R05.2 |
| | CD-322931 | 132/13.8kV GT-2 RELAY PANEL -1 | +R06.1 |
| | | 132/13.8kV GT-2 RELAY PANEL -2 | +R06.2 |
| | CD-322934 | 132/13.8kV GT-3 RELAY PANEL -1 | +R04.1 |
| | | 132/13.8kV GT-3 RELAY PANEL -2 | +R04.2 |
| | CD-322936 | 132/13.8kV TRANSFORMER-1,2& 3 AVC PANEL | +AVC |
| | CD-322922 | 132KV SPARE-1 UGF RELAY PANEL -1 | +R07.1 |
| | | 132KV SPARE-1 UGF RELAY PANEL -2 | +R07.2 |
| | CD-322916 | 132KV 8020 UGF RELAY PANEL -1 | +R02.1 |
| | | 132KV 8020 UGF RELAY PANEL -2 | +R02.2 |
| | CD-322922 | 132KV SPARE UGF RELAY PANEL -1 | +R06.1 |
| | | 132KV SPARE UGF RELAY PANEL -2 | +R06.2 |
| | CD-322925 | 132KV SPARE-2 UGF RELAY PANEL -1 | +R06.1 |
| | | 132KV SPARE-2 UGF RELAY PANEL -2 | +R06.2 |
| | CD-326012 | 132KV FOIP PANEL | +FOIP |
| | CD-322946 | 132kV BUS COUPLER-A | +R130 |
| | CD-322948 | 132kV BUS COUPLER-B | +R230 |
| | CD-322950 | 132kV BUS SECTION | +R120 |
| | CD-322991 | 132kV BUSBAR PROTECTION MAIN-1 CENTRAL UNIT PANEL | +BB1-1 |
| | CD-322993 | 132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL | +BB1-2 |
| | CD-322995 | 132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL | +BB1-3 |
| | CD-322997 | 132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL | +BB1-4 |
| | CD-322999 | 132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL | +BB1-5 |
| | CD-323001 | 132kV BUSBAR PROTECTION MAIN-2 CENTRAL UNIT PANEL | +BB2-1 |
| | CD-323003 | 132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL | +BB2-2 |
| | CD-323005 | 132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL | +BB2-3 |
| | CD-323007 | 132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL | +BB2-4 |
| | CD-323009 | 132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL | +BB2-5 |

AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

| | | |
|----------|-------|-----------------|
| 01 | 13 49 | FACTORY ASBUILT |
| 00 | 13 04 | FOR APPROVAL |
| REV. NO. | DATE | DESCRIPTION |

DRAWN BY RIZ CHECKED BY KVR
DATE STARTED 24.01.2013 DATE COMPLETED _____
OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

DRAWING REFERENCES

132kV UGF-SPARE-2 RELAY PANEL-1/2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | | REV. NO. |
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| - | C421 | CD-322922 | SHT | CONT. | 01 |
| | | | 015 | 016 | |


NG/D2-D (2012/01)

DMS

VECTOR

NGD200

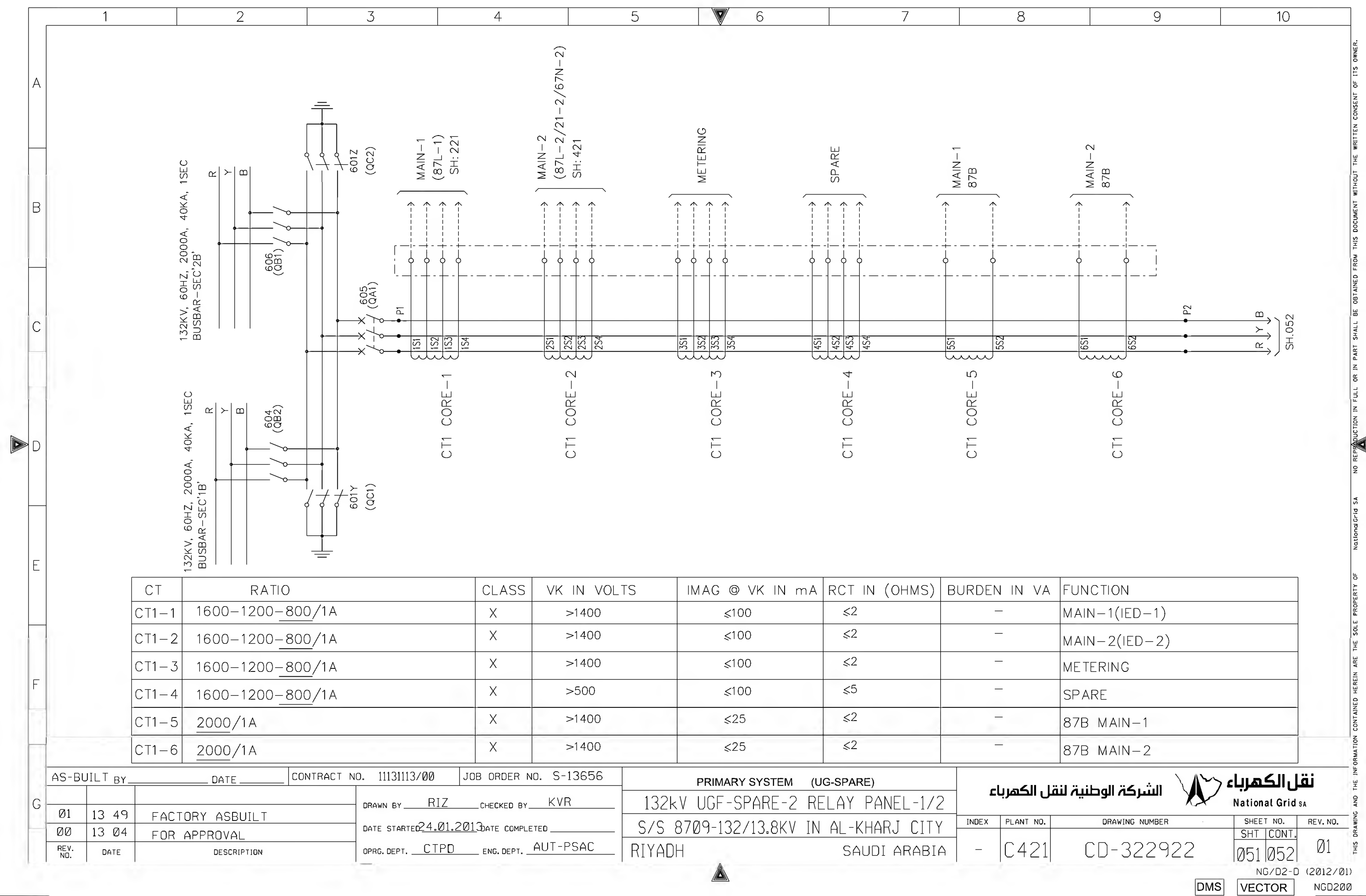
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| MANUFACTURER | SCHEMATICS DWG.NO | PANEL DESCRIPTION | PANEL REFERENCE |
|--|-------------------|--|-----------------|
|  PROTECTION & SUBSTATION AUTOMATION | | SS 8709 13.8KV RELAY PANELS | |
| | CD-322952 | 13.8KV Capacitor Bank-1 Protection Panel | +CBP-1 |
| | CD-322954 | 13.8KV Capacitor Bank-2 Protection Panel | +CBP-2 |
| | CD-322956 | 13.8KV Capacitor Bank-2 Protection Panel | +CBP-3 |
| | CD-322958 | 13.8 KV ACCS PANEL | +ACCS |
| | CD-322962 | 13.8KV ACSE PANEL | +ACSE |
| | CD-322968 | 13.8KV Under Voltage Load Shedding Panel | +UVLS |
| | CD-322964 | 13.8KV Under Frequency Load Shedding Panel-1 | +UFLS01 |
| | CD-322966 | 13.8KV Under Frequency Load Shedding Panel-2 | +UFLS02 |
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| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656 |
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ CHECKED BY KVR | |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 DATE COMPLETED _____ | |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | |

| DRAWING REFERENCES | |
|--------------------------------------|--|
| 132kV UGF-SPARE-2 RELAY PANEL-1/2 | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | |
| RIYADH SAUDI ARABIA | |

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| الشركة الوطنية لنقل الكهرباء | | |  نقل الكهرباء National Grid SA | | |
| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | | REV. NO. |
| - | C421 | CD-322922 | SHT | CONT. | 01 |
| | | | 016 | 051 | |



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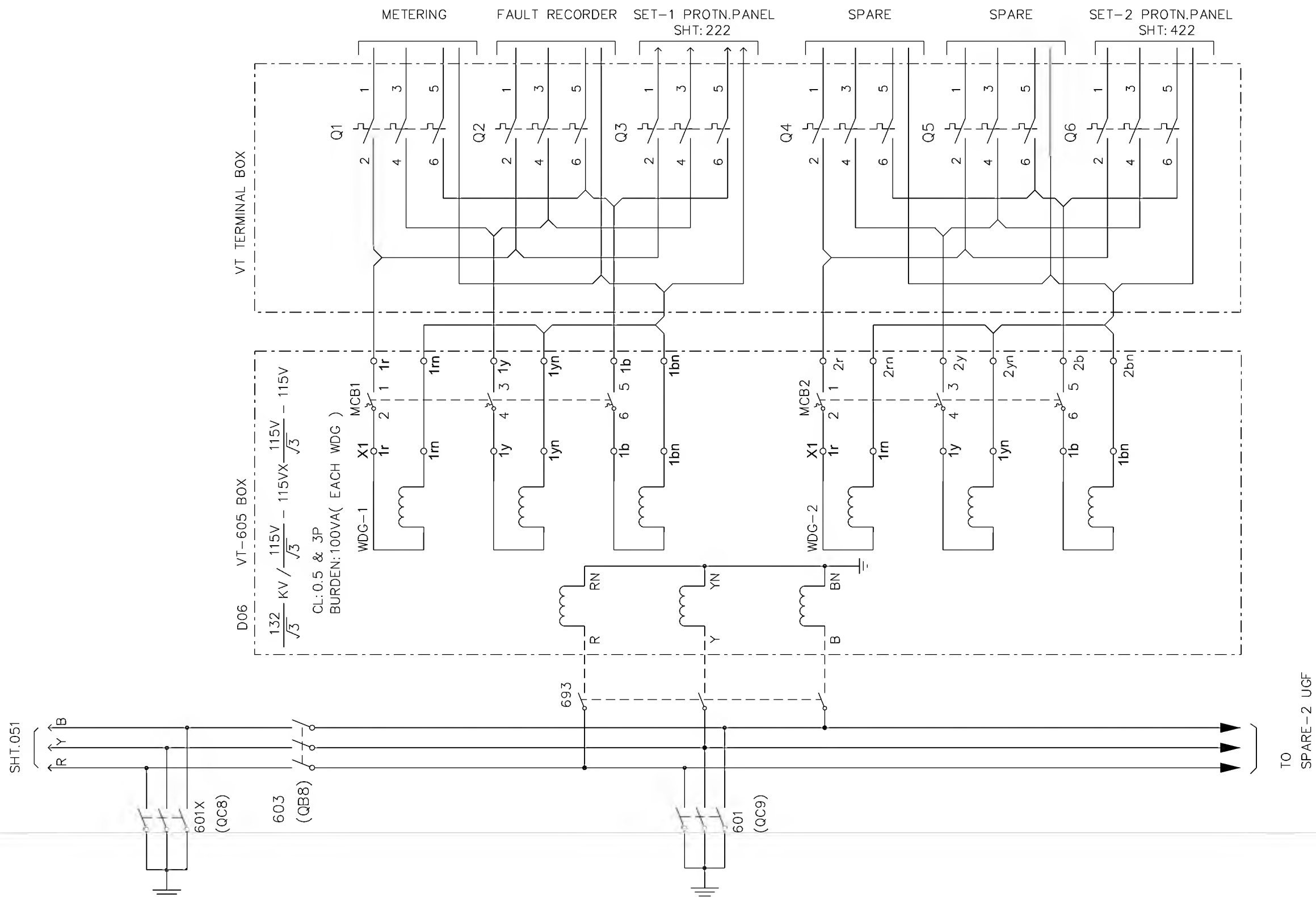
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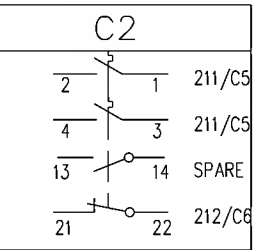
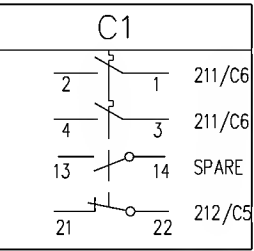
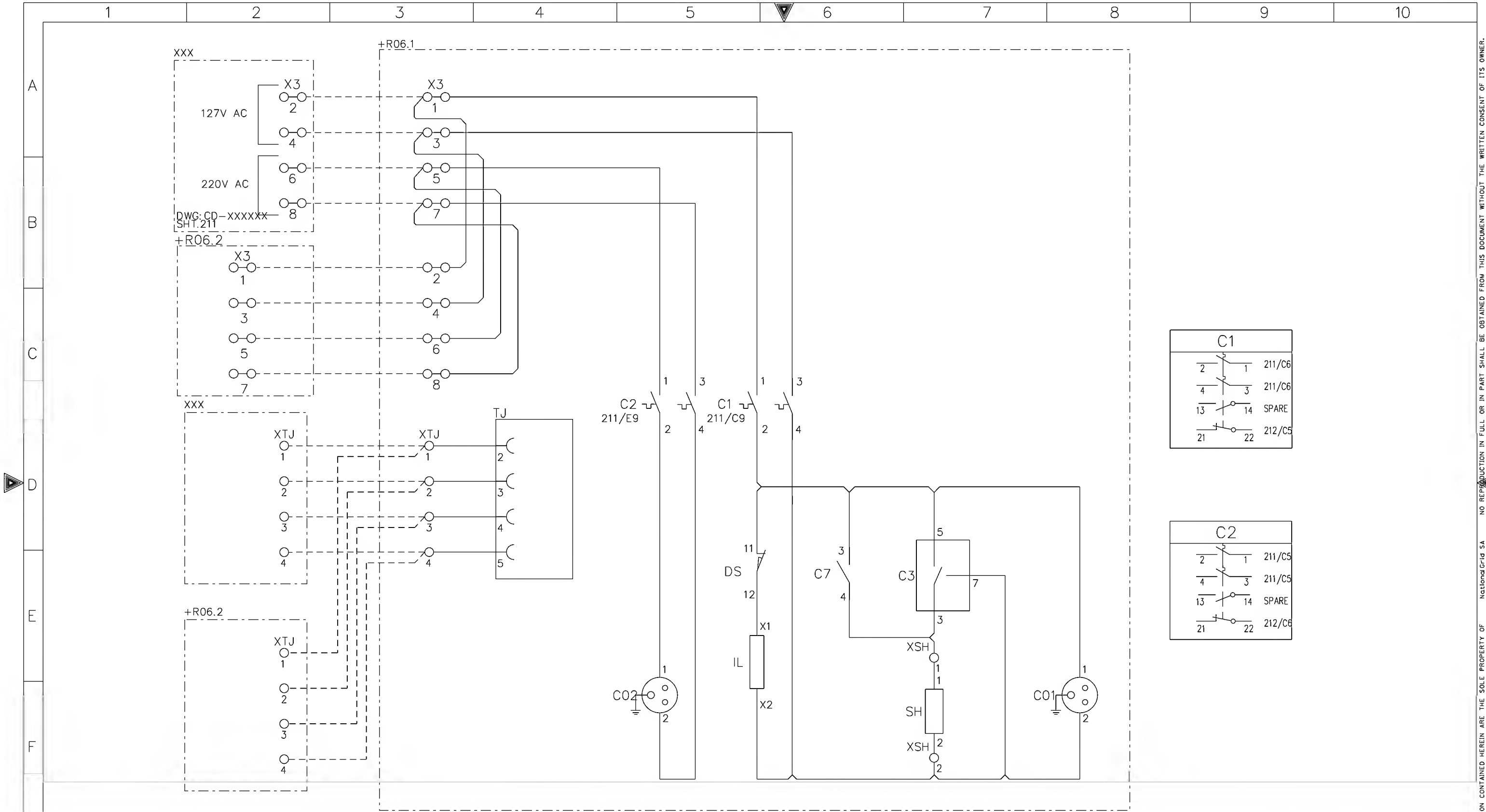
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| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | |
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | | CHECKED BY KVR | |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | |

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| PRIMARY SYSTEM (UG-SPARE) | |
| 132kV UGF-SPARE-2 RELAY PANEL-1/2 | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | |
| RIYADH SAUDI ARABIA | |

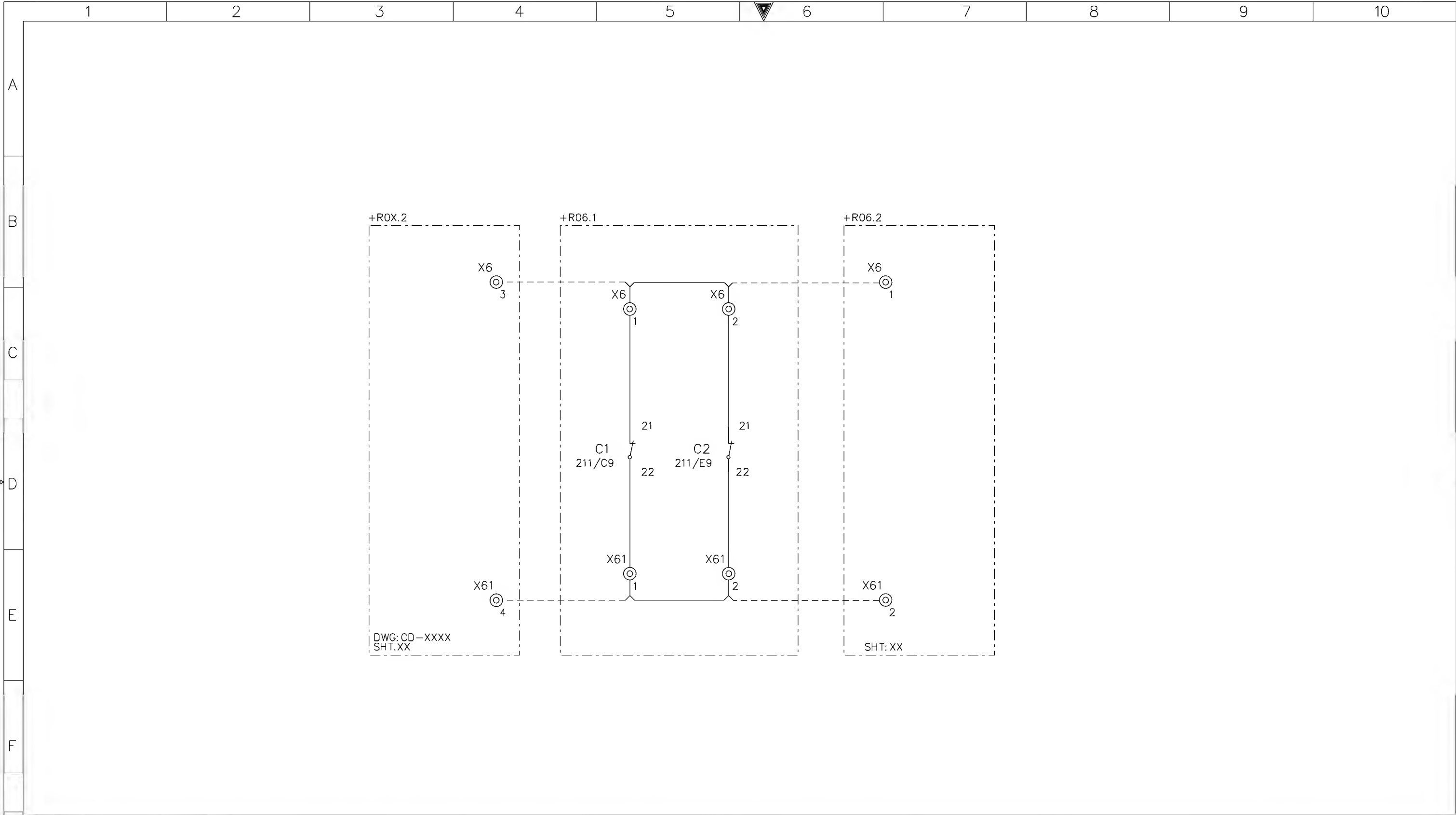
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| - | C421 | CD-322922 | SHT CONT. |
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| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656 |
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED _____ |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC |

AC SUPPLY FOR ILLUMINATION & POWER SOCKET
132kV UGF-SPARE-2 RELAY PANEL-1/2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

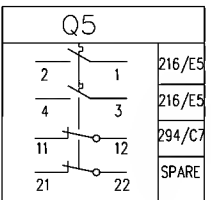
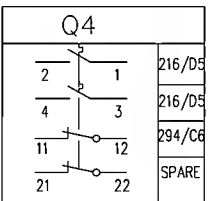
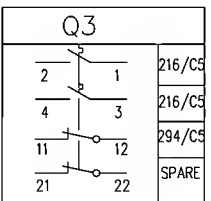
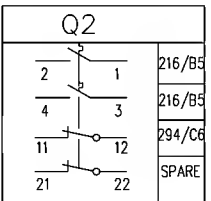
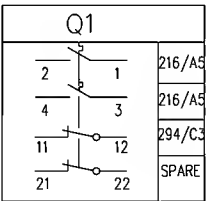
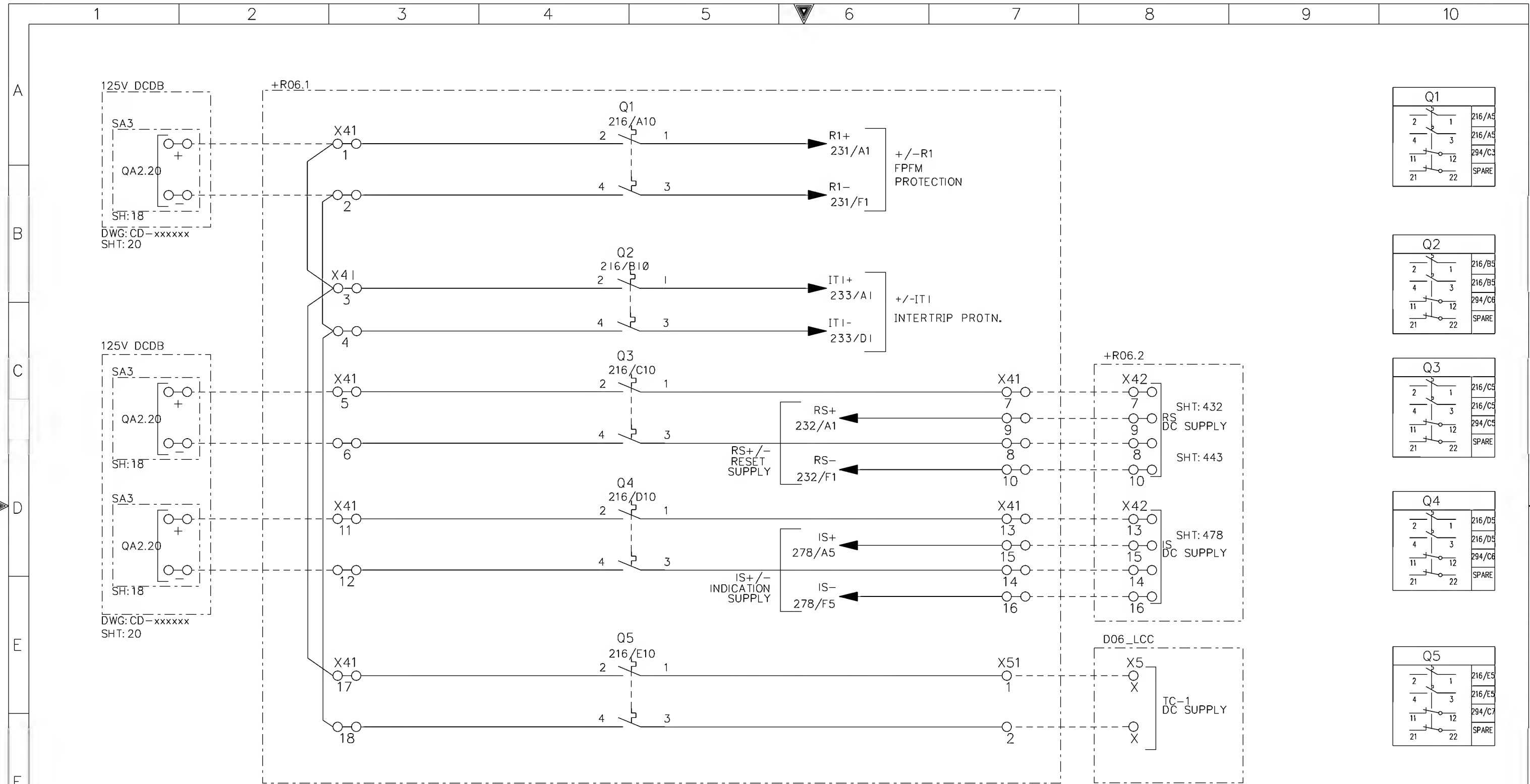
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| الشركة الوطنية لنقل الكهرباء | | نقل الكهرباء | | National Grid sa | |
| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. | |
| - | C421 | CD-322922 | SHT 211 | CONT. 212 | 01 |



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|------------------------------|--|--|---|--|---|--|--|--|-----|--|-----------|----------------|--|-----------|-------|----------|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | AC MCB AUX CONTACTS | | | <div>الشركة الوطنية لنقل الكهرباء</div> <div> نقل الكهرباء National Grid sa</div> | | | | | | |
| | | | DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u> | | | | 132kV UGF-SPARE-2 RELAY PANEL-1/2 | | | | | | | | | |
| 01 13 49 | | | FACTORY ASBUILT | | DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
| 00 13 04 | | | FOR APPROVAL | | | | RIYADH SAUDI ARABIA | | | - | C421 | CD-322922 | | SHT | CONT. | 01 |
| REV. NO. | | | DATE | | DESCRIPTION | | OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u> | | 212 | | | | | 216 | | |

NG/D2-D (2012/01)

DMS VECTOR NGD200



AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

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|----------|-------|-----------------|-------------------------|----------------------|
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED _____ |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC |

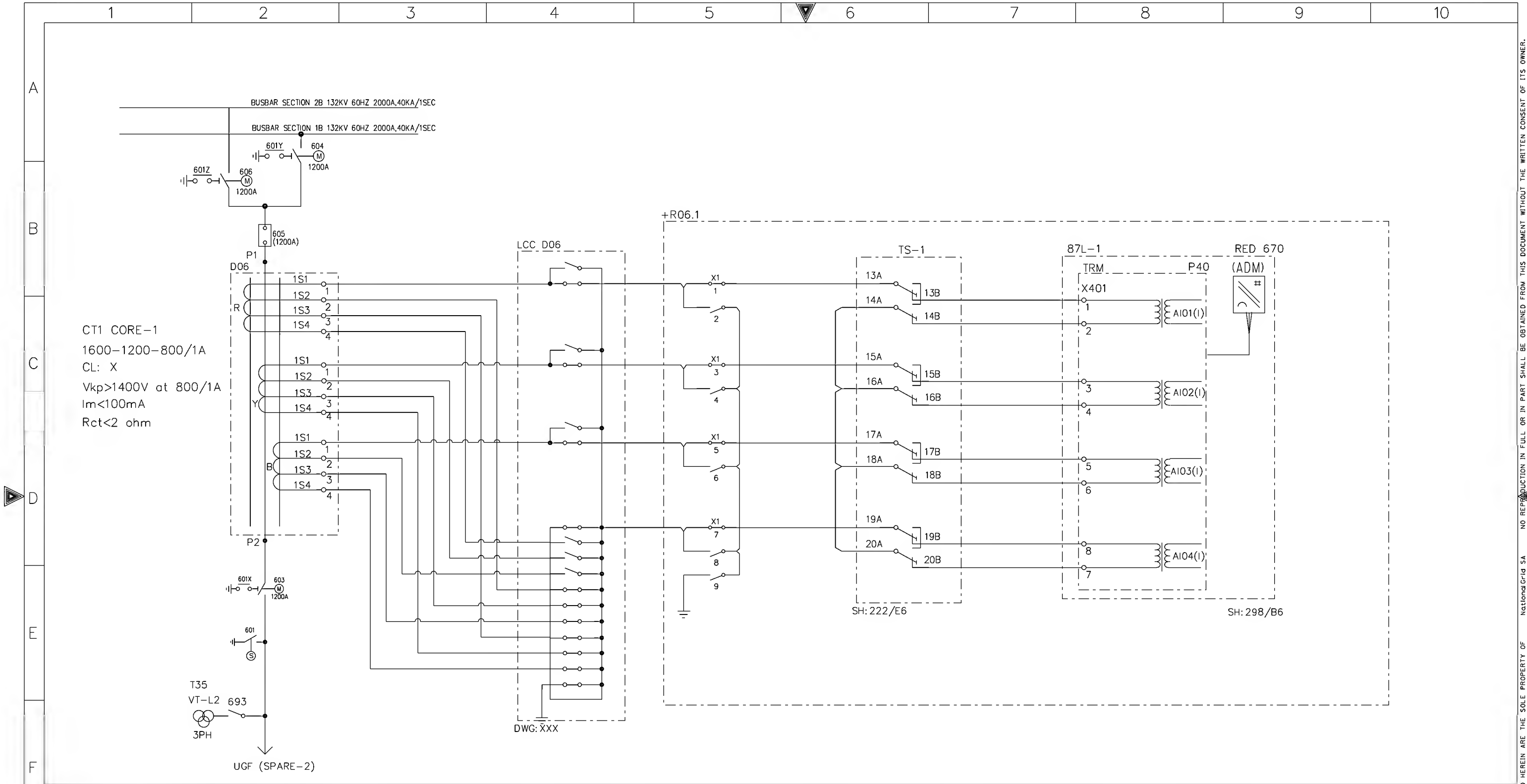
DC SUPPLY DISTRIBUTION

132kV UGF-SPARE-2 RELAY PANEL-1/2

S/S 8709-132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

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| الشركة الوطنية لنقل الكهرباء | |  | | نقل الكهرباء | | |
| | | | | National Grid SA | | |
| INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
| - | C421 | CD-322922 | | SHT | CONT. | 01 |
| | | | | 216 | 221 | |

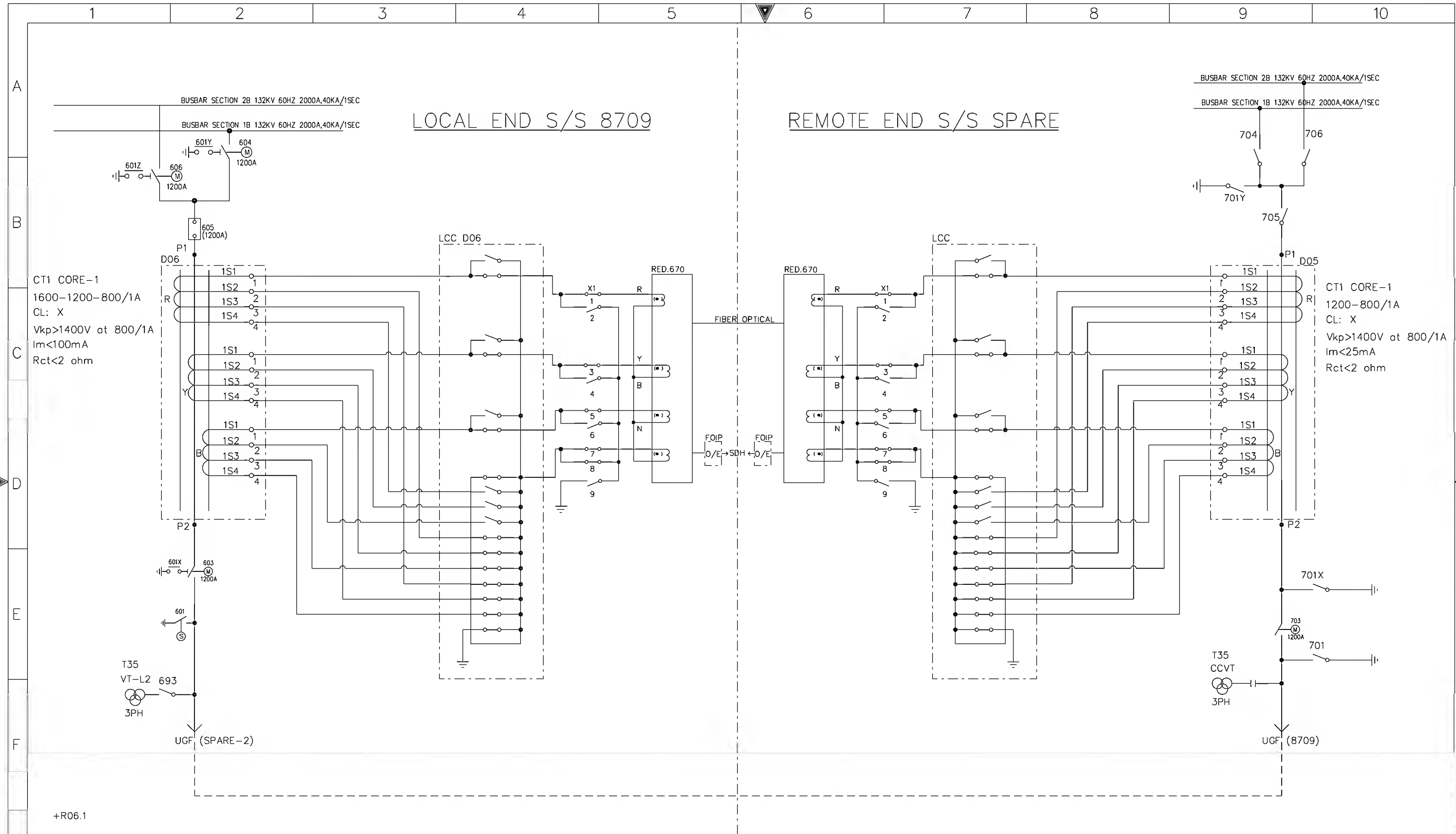


+R06.1

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|------------------------------|-------|-----------------|--------------------------|--|-----------------------|--|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | |
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | | CHECKED BY KVR | |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | |

CURRENT TRANSFORMER INPUTS -87L-1
132kV UGF-SPARE-2 RELAY PANEL-1+R06.1
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

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|------------------------------|-----------|---|--|------------------|-------|----------|
| الشركة الوطنية لنقل الكهرباء | |  | | نقل الكهرباء | | |
| | | | | National Grid SA | | |
| INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
| - | C421 | CD-322922 | | SHT | CONT. | 01 |
| | | | | 221 | 222 | |

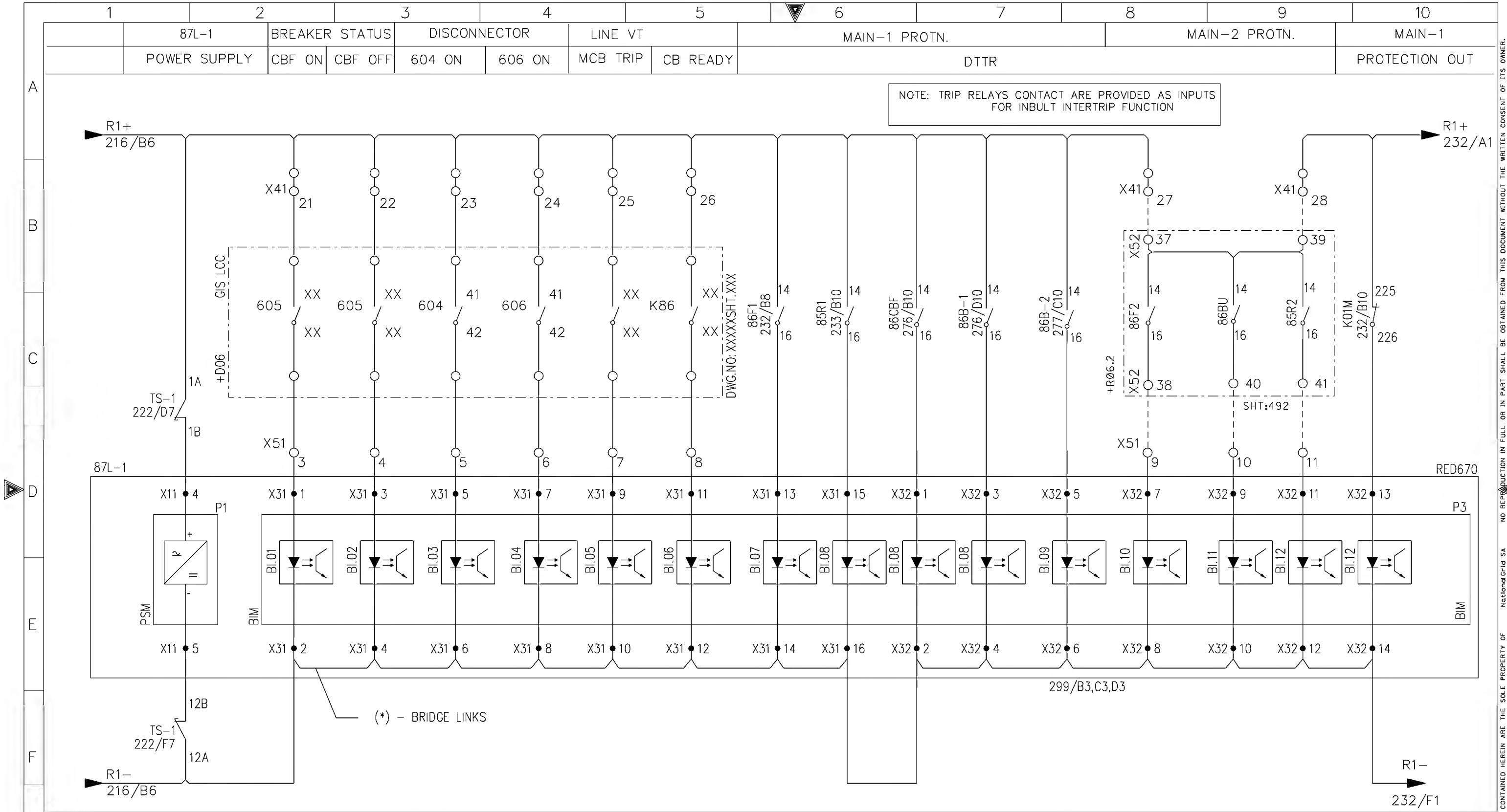


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| AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656 |
| 01 | 13 49 | FACTORY ASBUILT | |
| 00 | 13 04 | FOR APPROVAL | |
| REV. NO. | DATE | DESCRIPTION | |
| DRAWN BY RIZ | | CHECKED BY KVR | |
| DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | |
| OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | |

| | |
|---------------------------------------|--|
| COMMUNICATION CIRCUITS | |
| 132kV UGF-SPARE-2 RELAY PANEL-1+R06.1 | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | |
| RIYADH SAUDI ARABIA | |

| | | | |
|------------------------------|-----------|------------------|-----------|
| الشركة الوطنية لنقل الكهرباء | | نقل الكهرباء | |
| National Grid sa | | National Grid sa | |
| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. |
| - | C421 | CD-322922 | 223 |
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AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

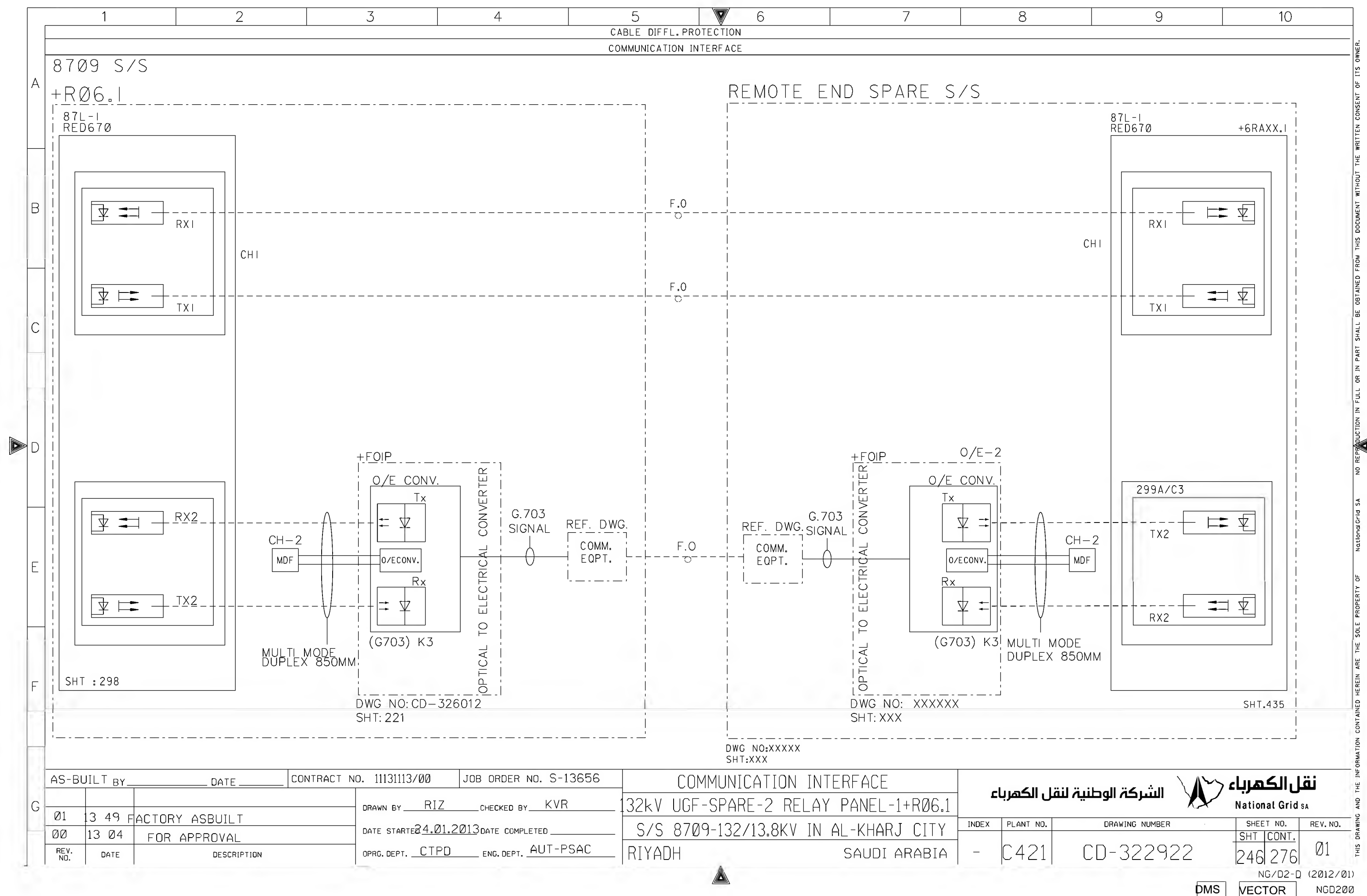
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|----------|-------|-----------------|-------------------------|---------------------|
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC |

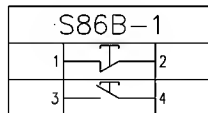
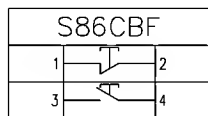
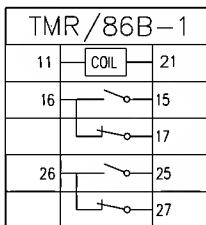
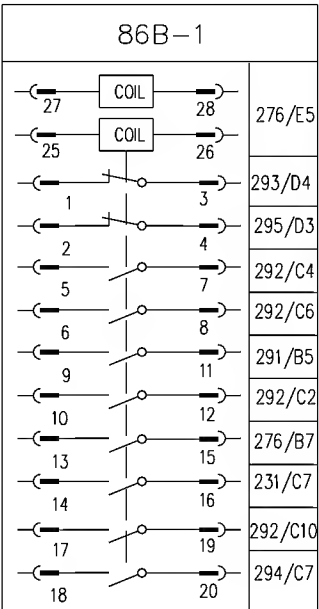
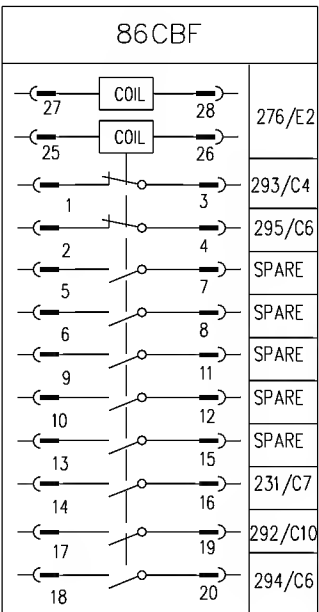
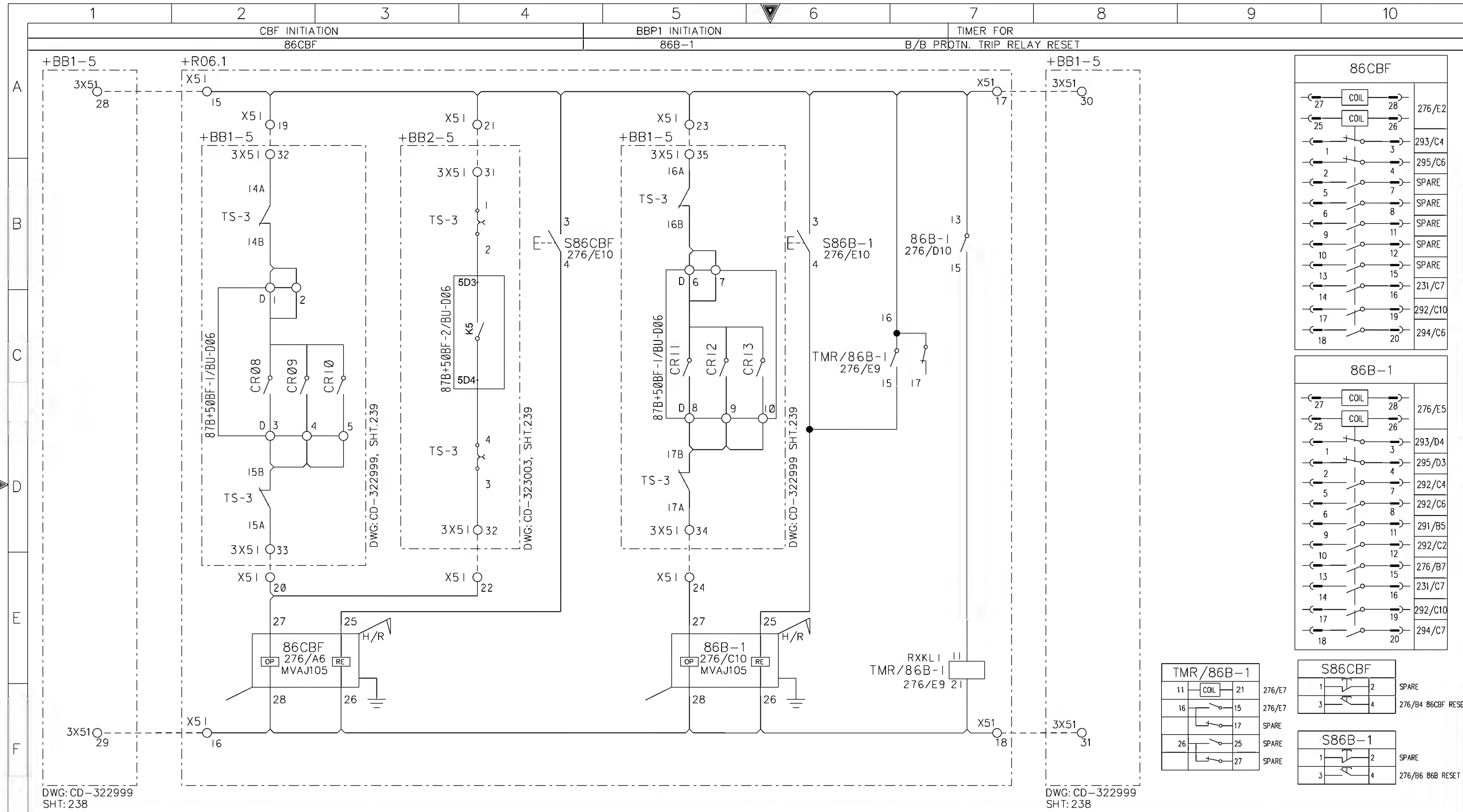
MAIN-1 PROTN. 87L-1 RELAY-BINARY INPUTS
132kV UGF-SPARE-2 RELAY PANEL-1+R06.1
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
National Grid sa

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NG/D2-D (2012/01)
DMS VECTOR NGD200

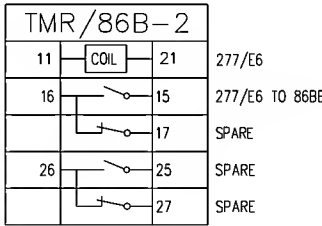
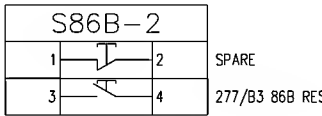
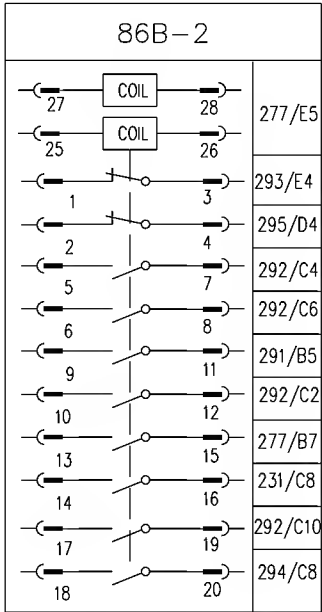
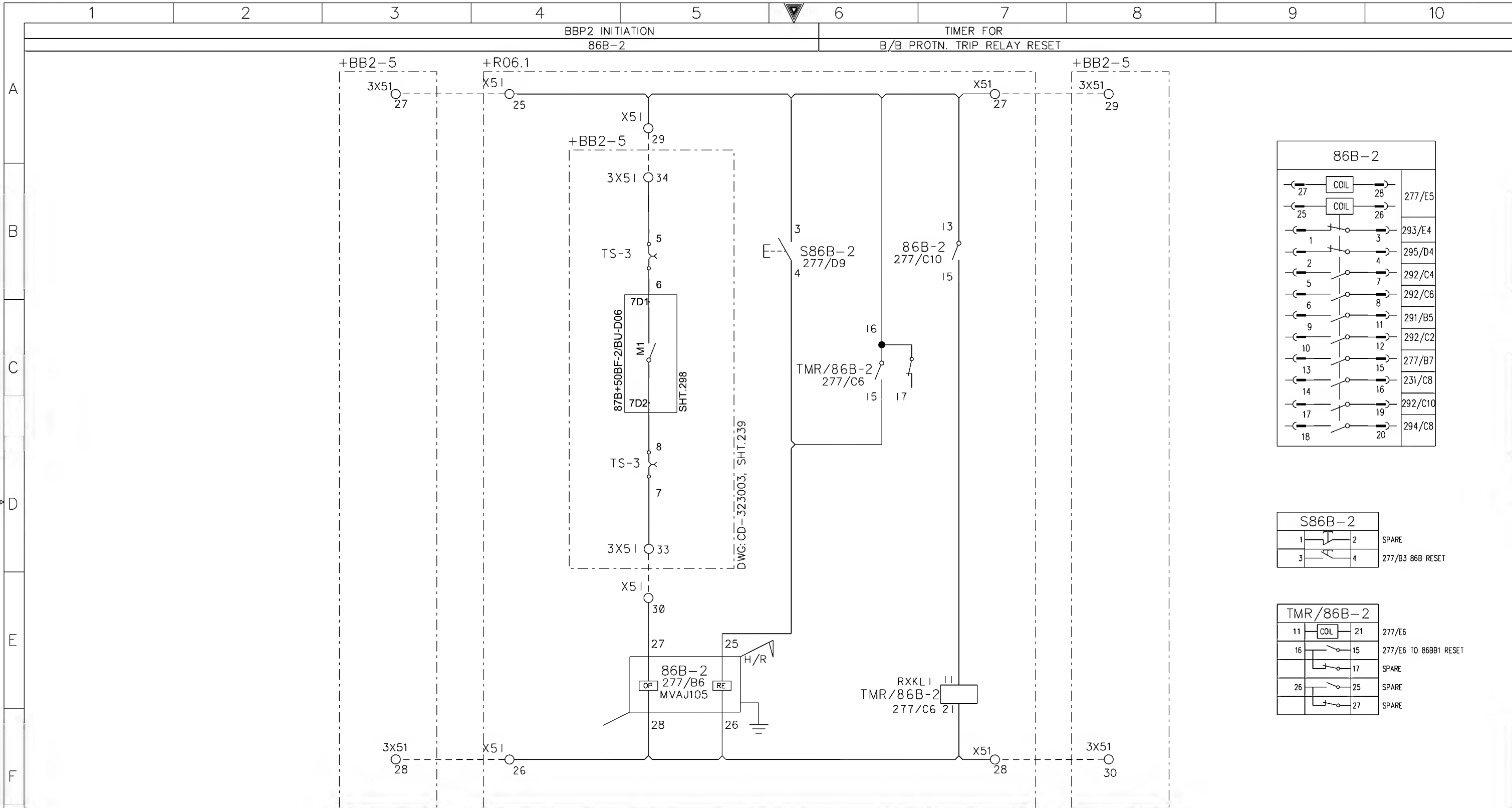




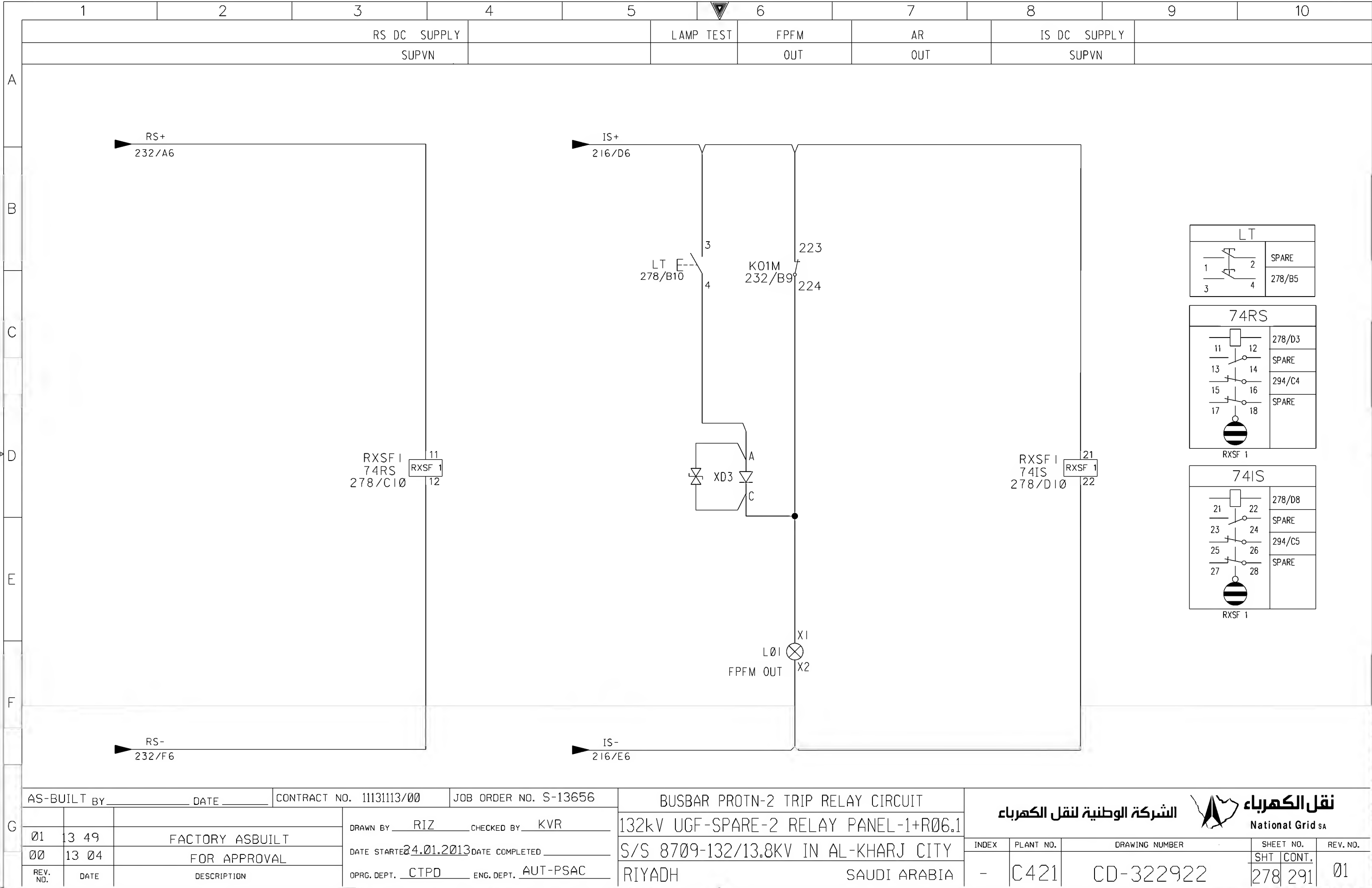
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| AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | |
| 01 | 13 49 | FACTORY ASBUILT | | DRAWN BY RIZ | CHECKED BY KVR |
| 00 | 13 04 | FOR APPROVAL | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | |
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CBF-1/2 & BUSBAR PROTN-1 TRIP RELAY CIRCUIT
132kV UGF-SPARE-2 RELAY PANEL-1+R06.1
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

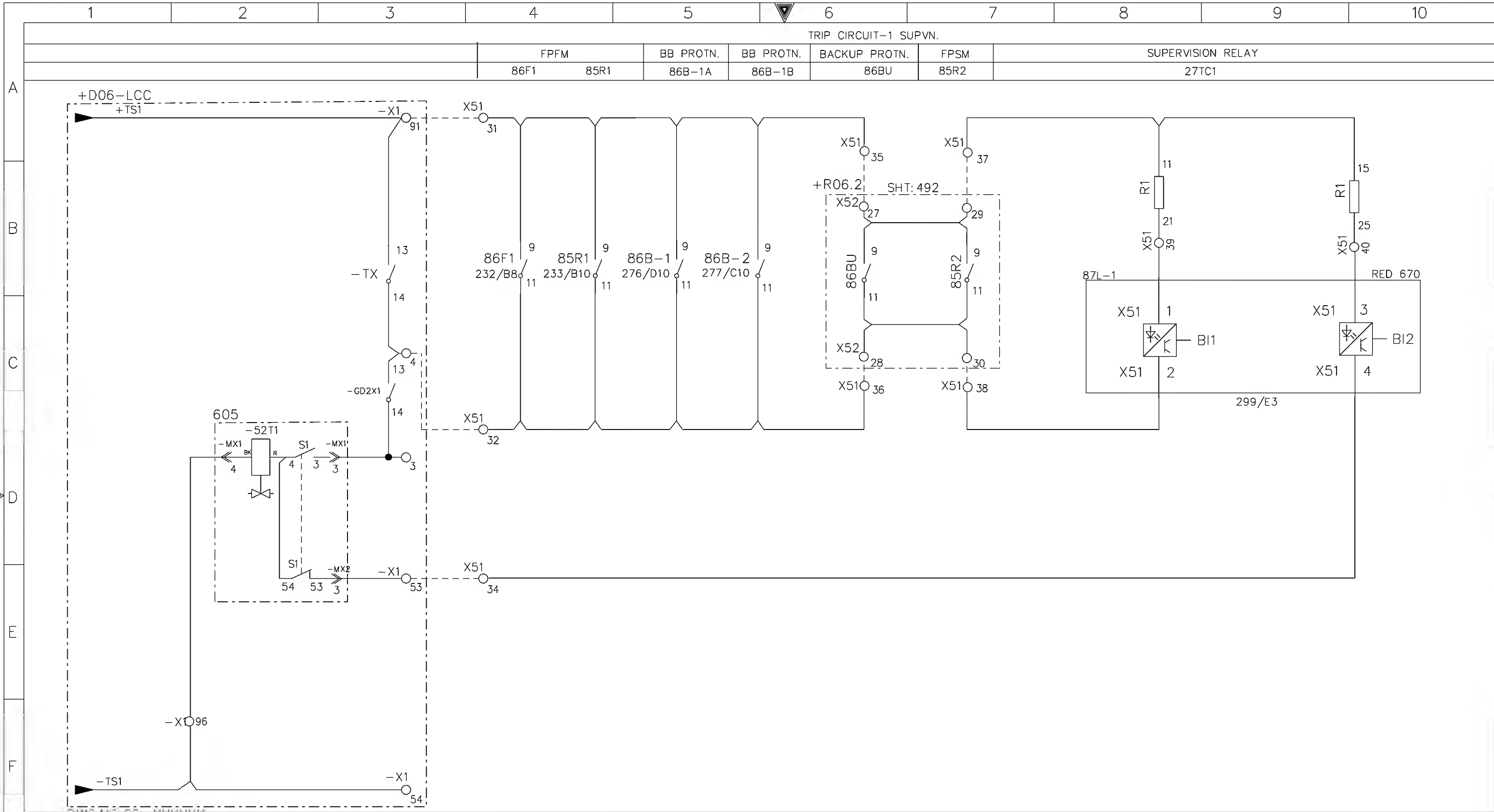
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|------------------------------|-----------|---|--|----------------------------------|--------------|----------|
| الشركة الوطنية لنقل الكهرباء | |  | | نقل الكهرباء National Grid SA | | |
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|------------------------------|-------|-----------------|---|---|---------------------------------------|--------------------------------------|-----------------------------------|-------|---|----------------|--|-----------|-------|----------|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | BUSBAR PROTN-2 TRIP RELAY CIRCUIT | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div> | | | | | |
| | | | DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u> | | 132kV UGF-SPARE-2 RELAY PANEL-1+R06.1 | | | | | | | | | |
| 01 | 13 49 | FACTORY ASBUILT | | DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
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DWG.NO.CD-XXXXXX
SHT.XX

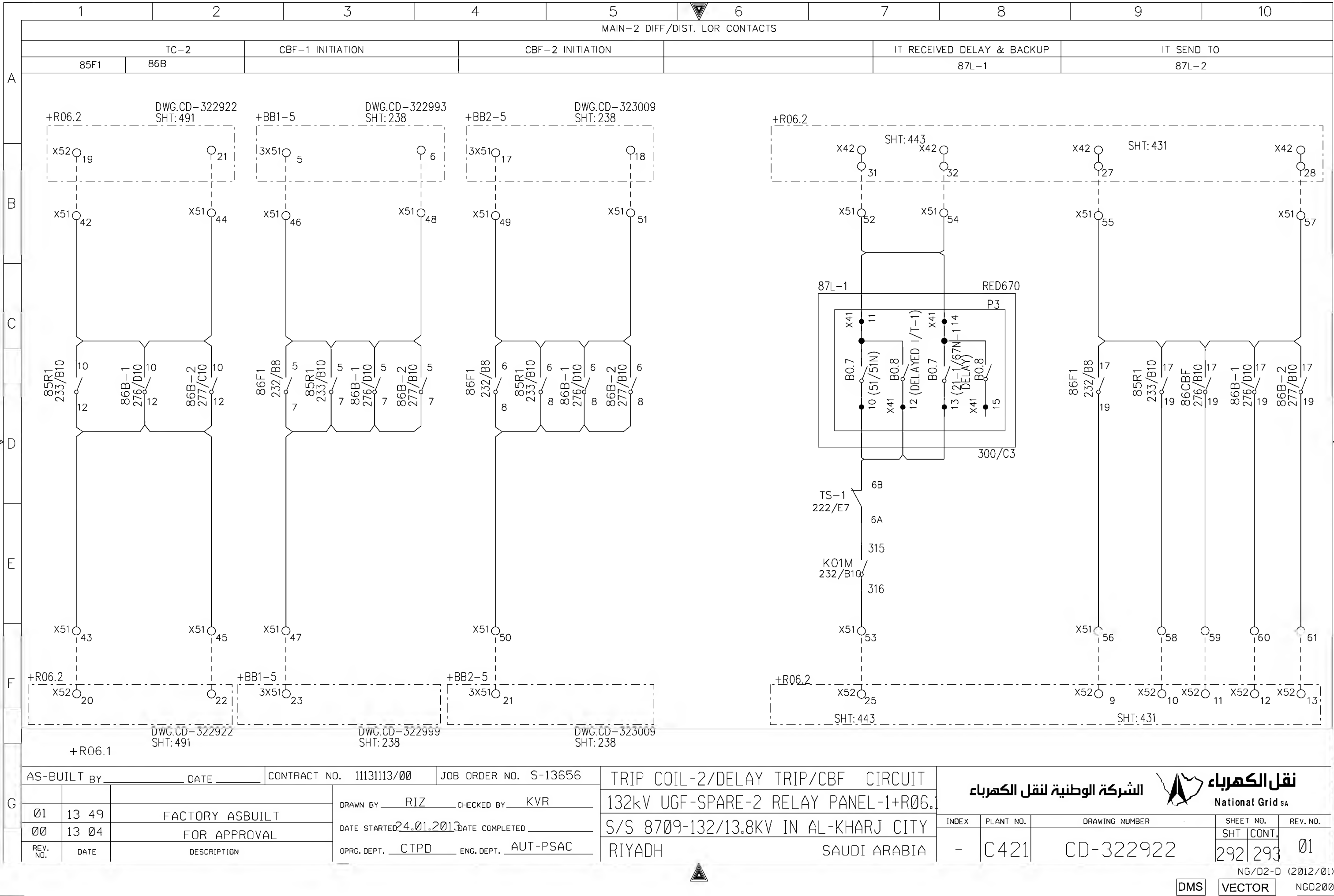
+R06.1

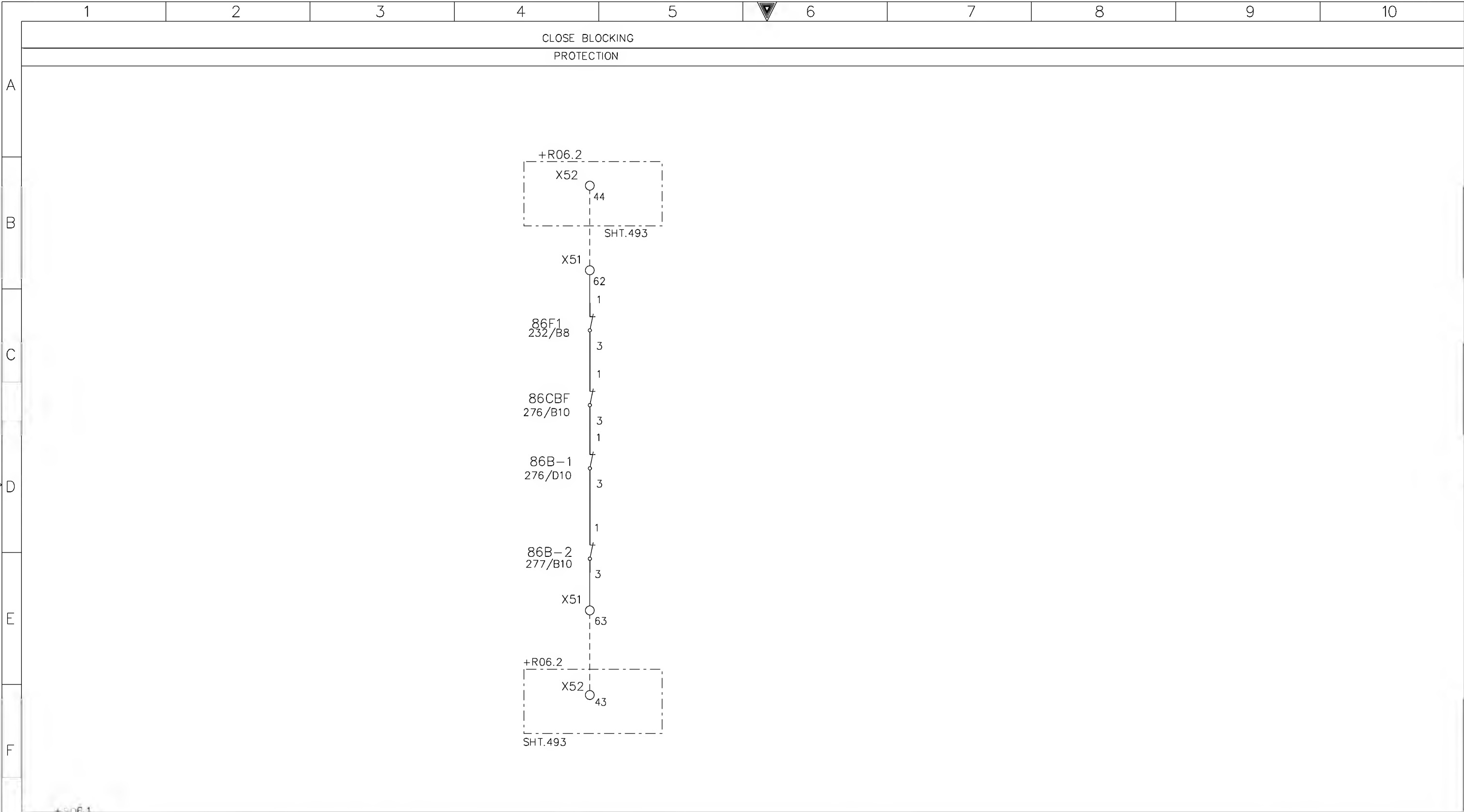
AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

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| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC |

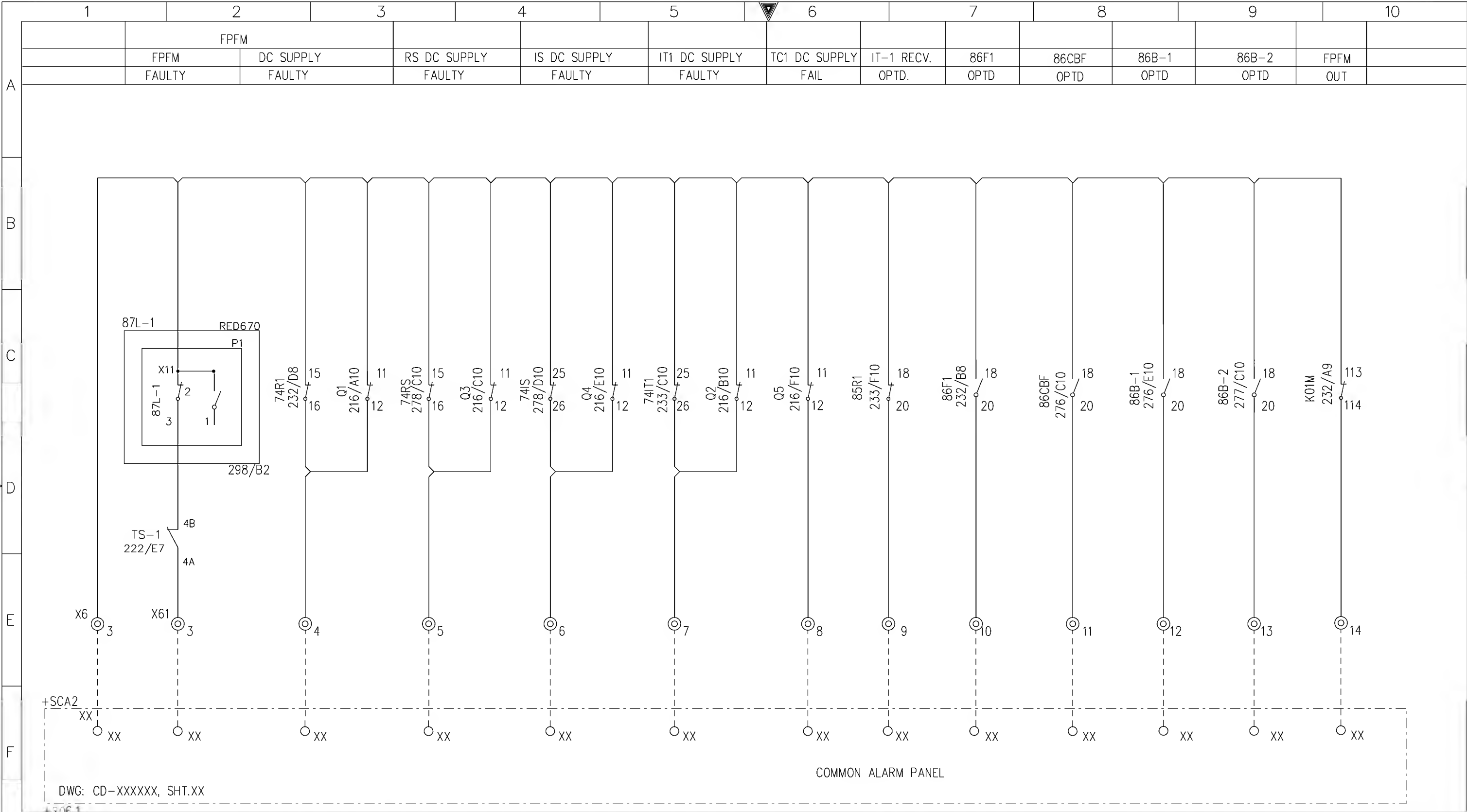
TRIP COIL-1 SUPERVSION CIRCUIT
132kV UGF-SPARE-2 RELAY PANEL-1+R06.1
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

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| الشركة الوطنية لنقل الكهرباء | | نقل الكهرباء | |
| | | National Grid sa | |
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| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | CLOSE BLOCK CIRCUIT | | الشركة الوطنية لنقل الكهرباء National Grid SA | | | | | | | | | | |
| | | | DRAWN BY _____ RIZ _____ CHECKED BY _____ KVR | | | 132kV UGF-SPARE-2 RELAY PANEL-1+R06.1 | | | INDEX | | PLANT NO. | | DRAWING NUMBER | | SHEET NO. | | REV. NO. | | |
| 01 13 49 | | | FACTORY ASBUILT | | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | | | | SHT | | CONT. | |
| 00 13 04 | | | FOR APPROVAL | | | OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC | | | RIYADH | | | - | | C421 | | CD-322922 | | 293 294 | |
| REV. NO. | | | DATE | | | DESCRIPTION | | | SAUDI ARABIA | | | | | | | | | 01 | |




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| AS-BUILT BY _____ | | DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | |
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| 00 | 13 04 | FOR APPROVAL | | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | |
| REV. NO. | DATE | DESCRIPTION | | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | |

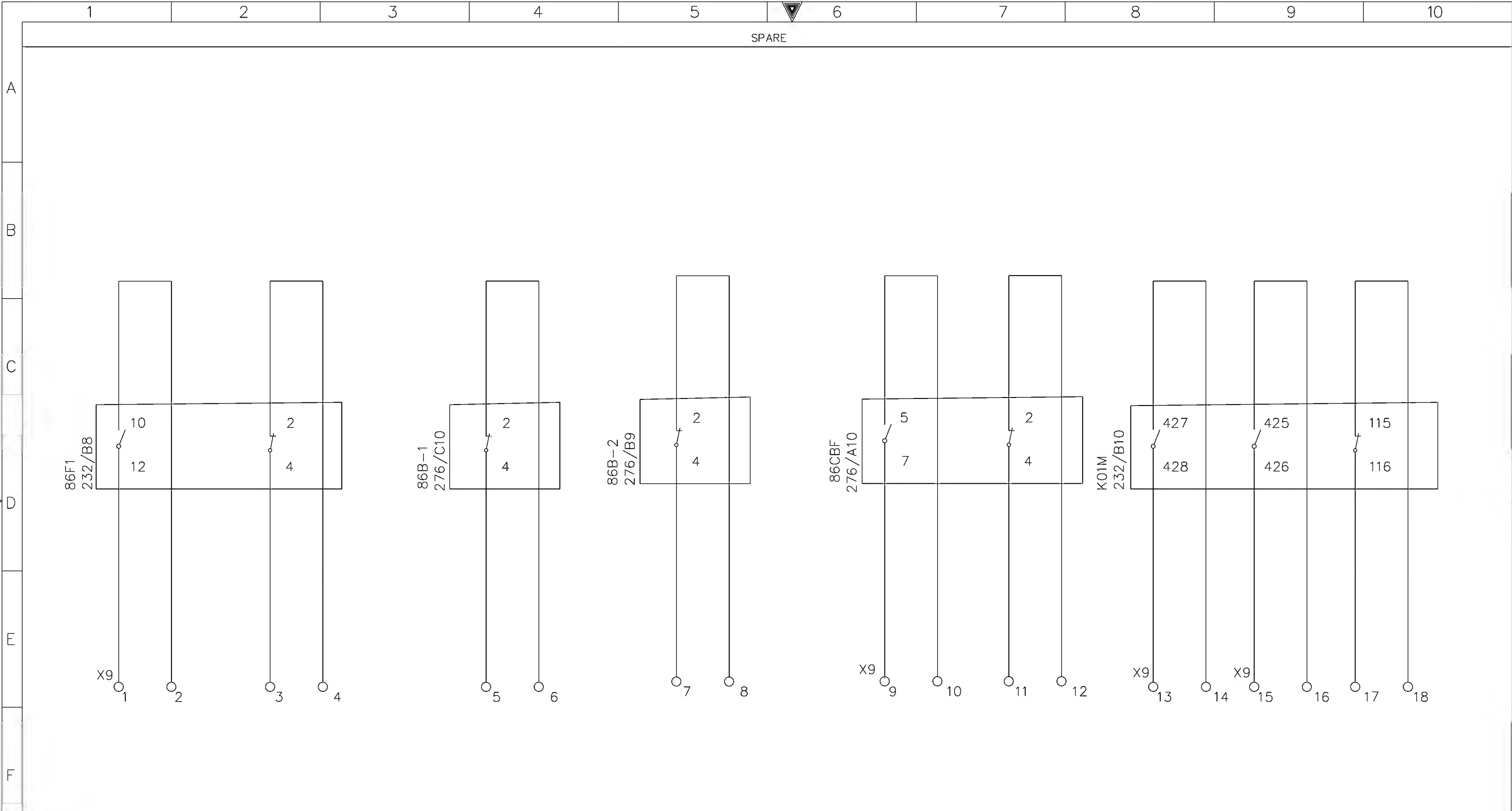
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| COMMON ALARM CIRCUITS | | | |
| 132kV UGF-SPARE-2 RELAY PANEL-1+R06.1 | | | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | |
| RIYADH | | SAUDI ARABIA | |

الشركة الوطنية لنقل الكهرباء



National Grid SA

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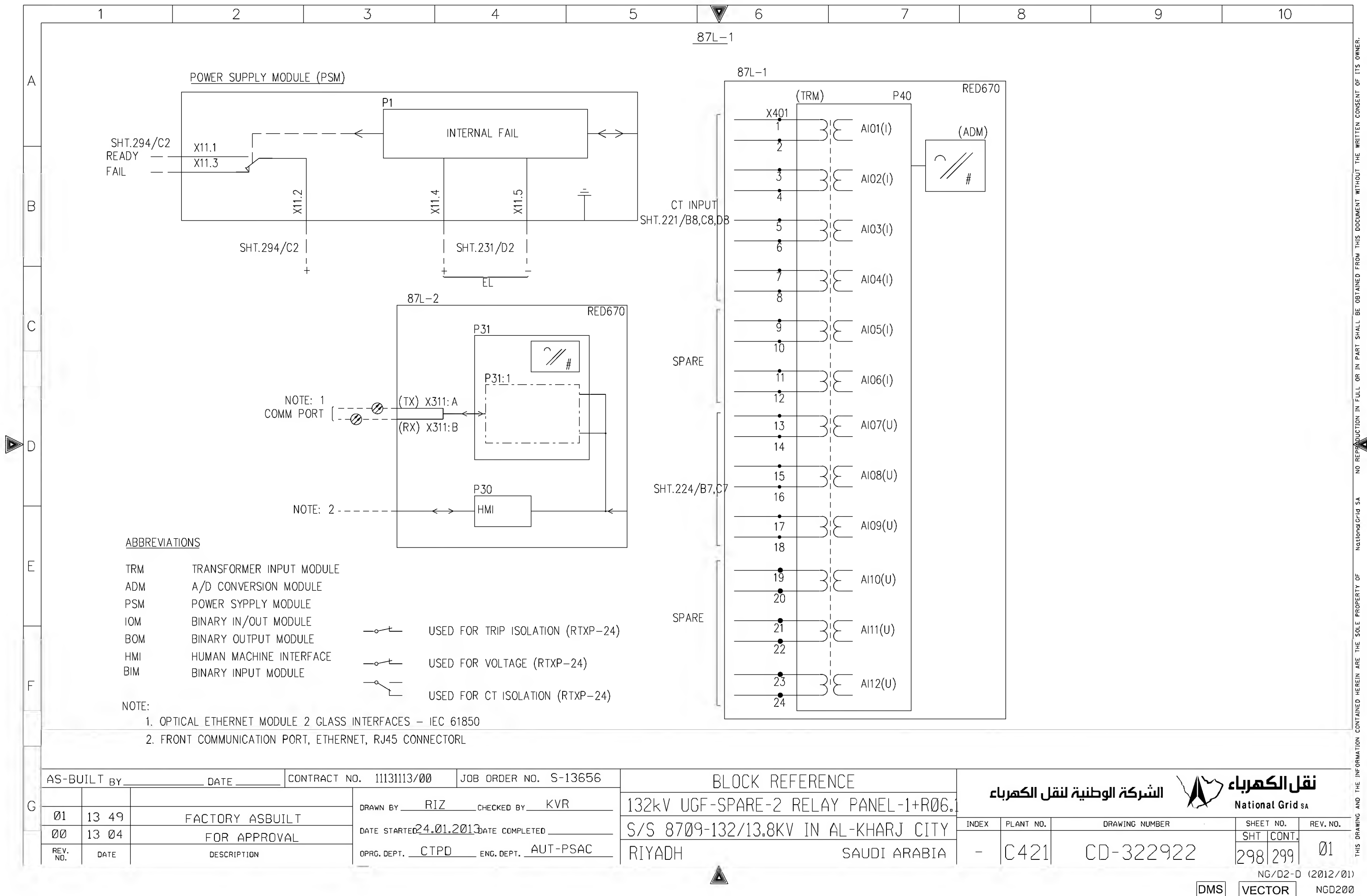


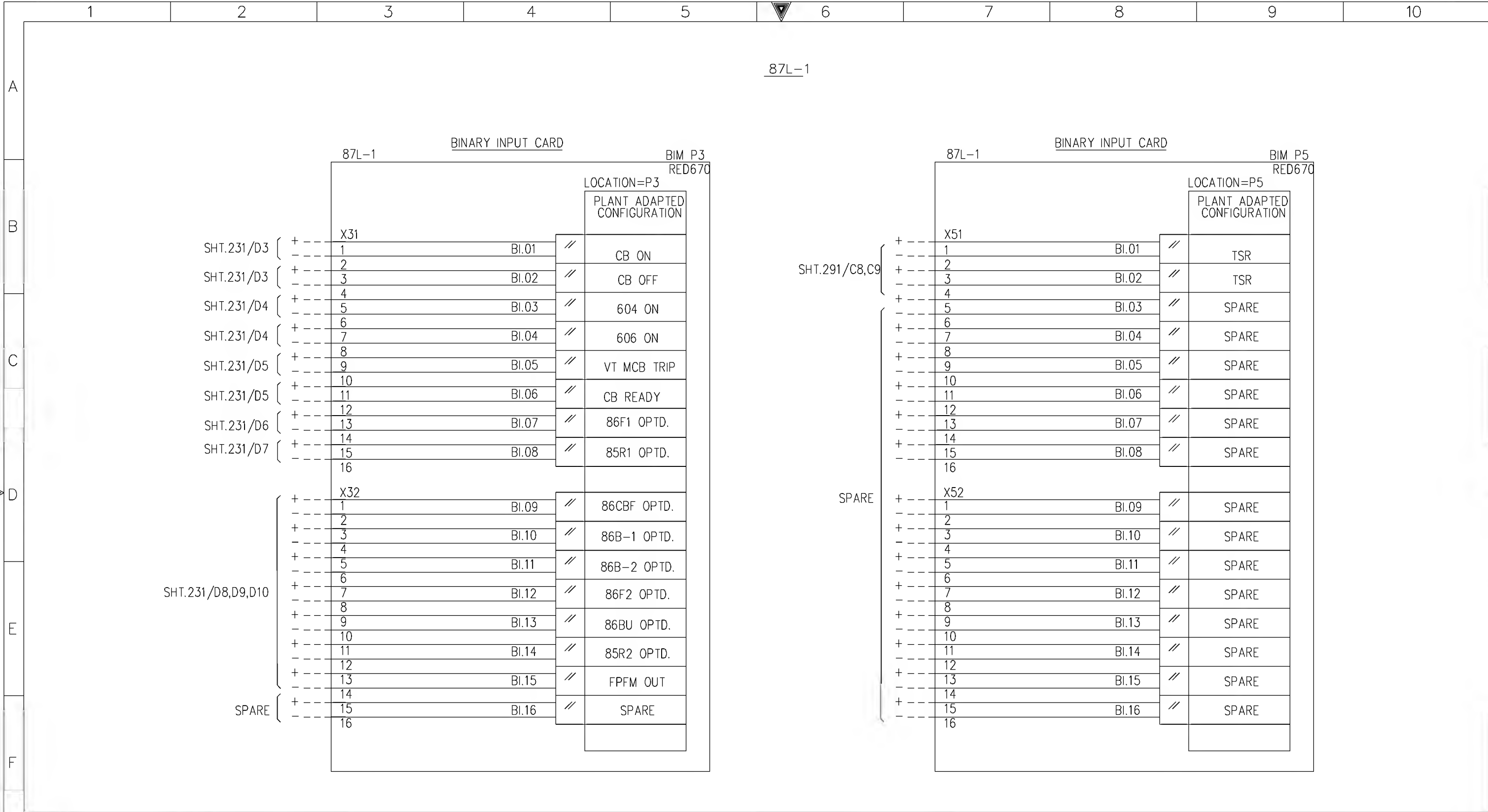
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| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | |
| 01 | 13 49 | FACTORY ASBUILT FOR APPROVAL | DRAWN BY RIZ | | CHECKED BY KVR | |
| 00 | 13 04 | | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | |
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|---------------------------------------|--|
| SPARE CONTACTS | |
| 132kV UGF-SPARE-2 RELAY PANEL-1+R06.1 | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | |
| RIYADH SAUDI ARABIA | |

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| الشركة الوطنية لنقل الكهرباء | | |  نقل الكهرباء | | National Grid SA | |
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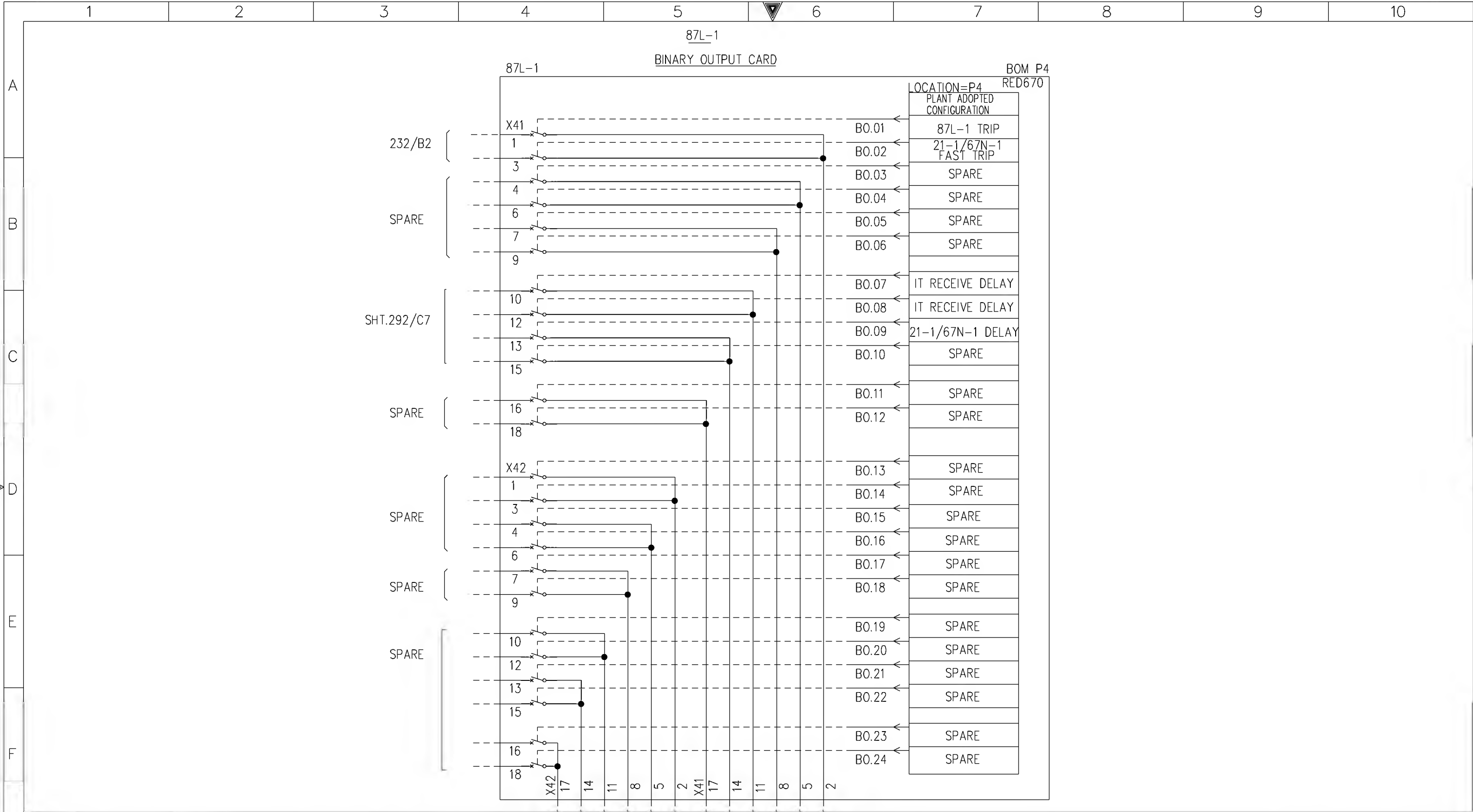


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| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | BLOCK REFERENCE | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div> | |
| 01 13 49 | | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-SPARE-2 RELAY PANEL-1+R06.1 | | INDEX | | PLANT NO. | |
| 00 13 04 | | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | DRAWING NUMBER | | SHEET NO. | |
| FOR APPROVAL | | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | CD-322922 | | REV. NO. | |
| REV. NO. DATE DESCRIPTION | | | | | | | - C421 | | SHT CONT. | |
| | | | | | | | | | 299 300 01 | |

NG/D2-D (2012/01)

DMS VECTOR

NGD200



AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

01

13 49

FACTORY ASBUILT

00

13 04

FOR APPROVAL

REV. NO.

DATE

DESCRIPTION

DRAWN BY RIZ

CHECKED BY KVR

DATE STARTED 24.01.2013

DATE COMPLETED _____

OPRG. DEPT. CTPD

ENG. DEPT. AUT-PSAC


BLOCK REFERENCE

132kV UGF-SPARE-2 RELAY PANEL-1+R06.1

S/S 8709-132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

 **نقل الكهرباء**
National Grid sa

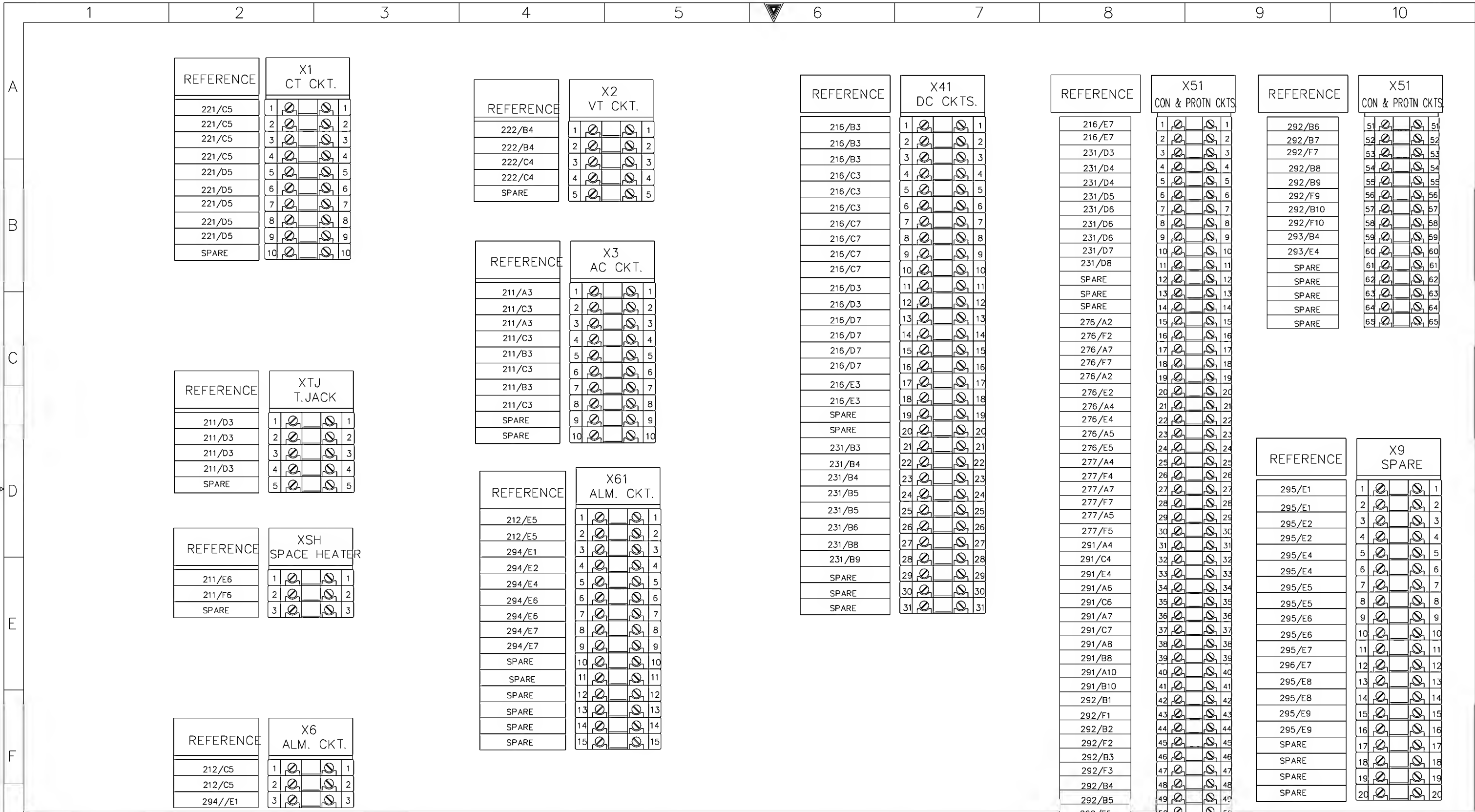
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NG/D2-D (2012/01)

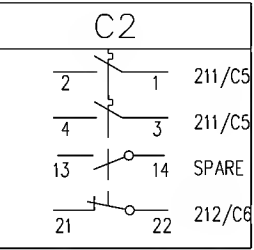
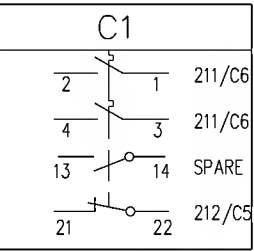
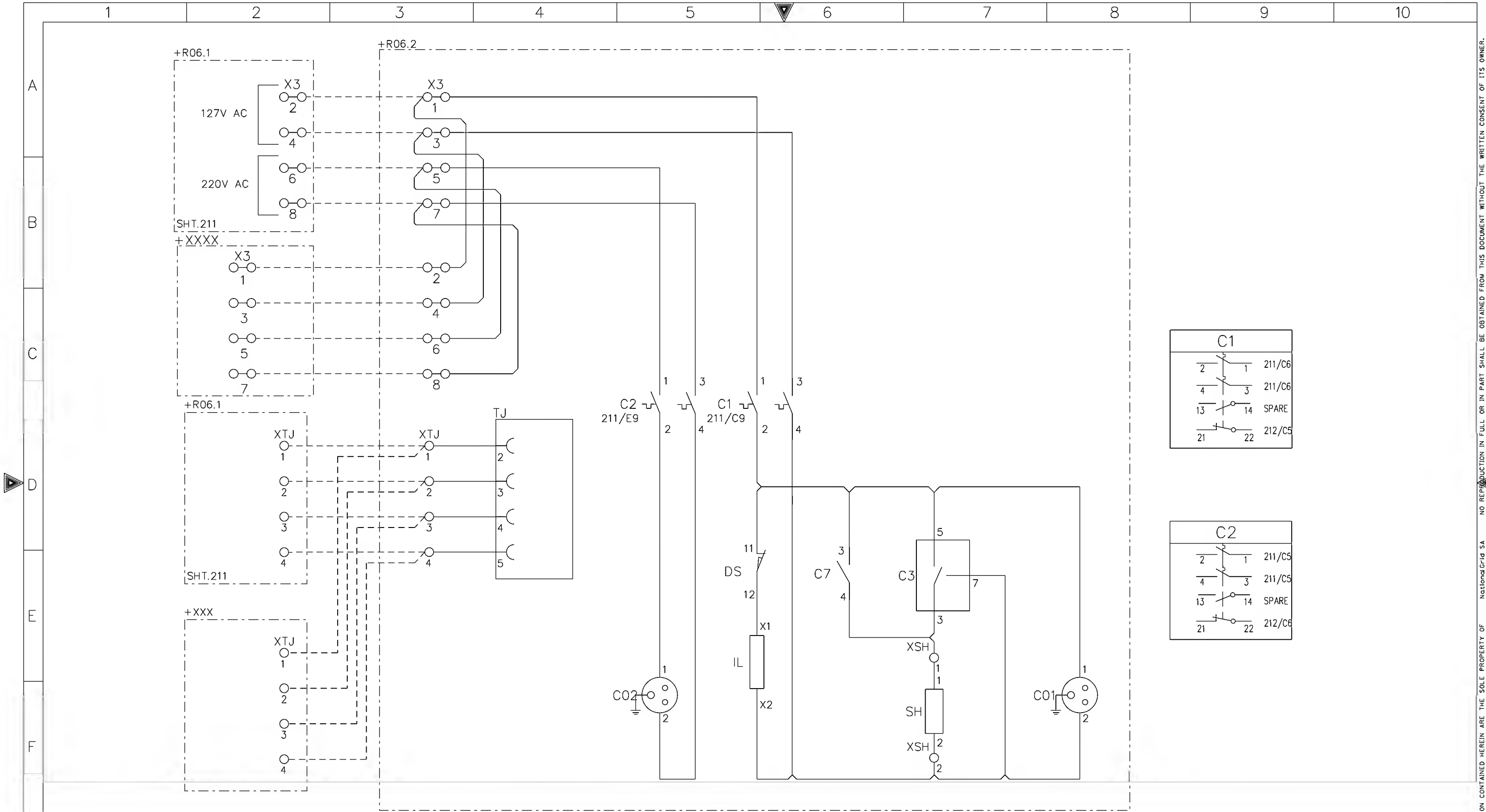
DMS

VECTOR

NGD200



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|------------------------------|--|--------------------------|--|-------------------------|--|-----------------------|--|------------------------------|--|--------------------------|--|
| AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | TERMINAL BLOCKS PANEL | | الشركة الوطنية لنقل الكهرباء | | نقل الكهرباء | |
| DRAWN BY RIZ | | CHECKED BY KVR | | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | | PLANT NO. C421 | | DRAWING NUMBER CD-322922 | |
| DATE 13 04 | | DESCRIPTION FOR APPROVAL | | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | | INDEX - | | SHEET NO. 301 | |
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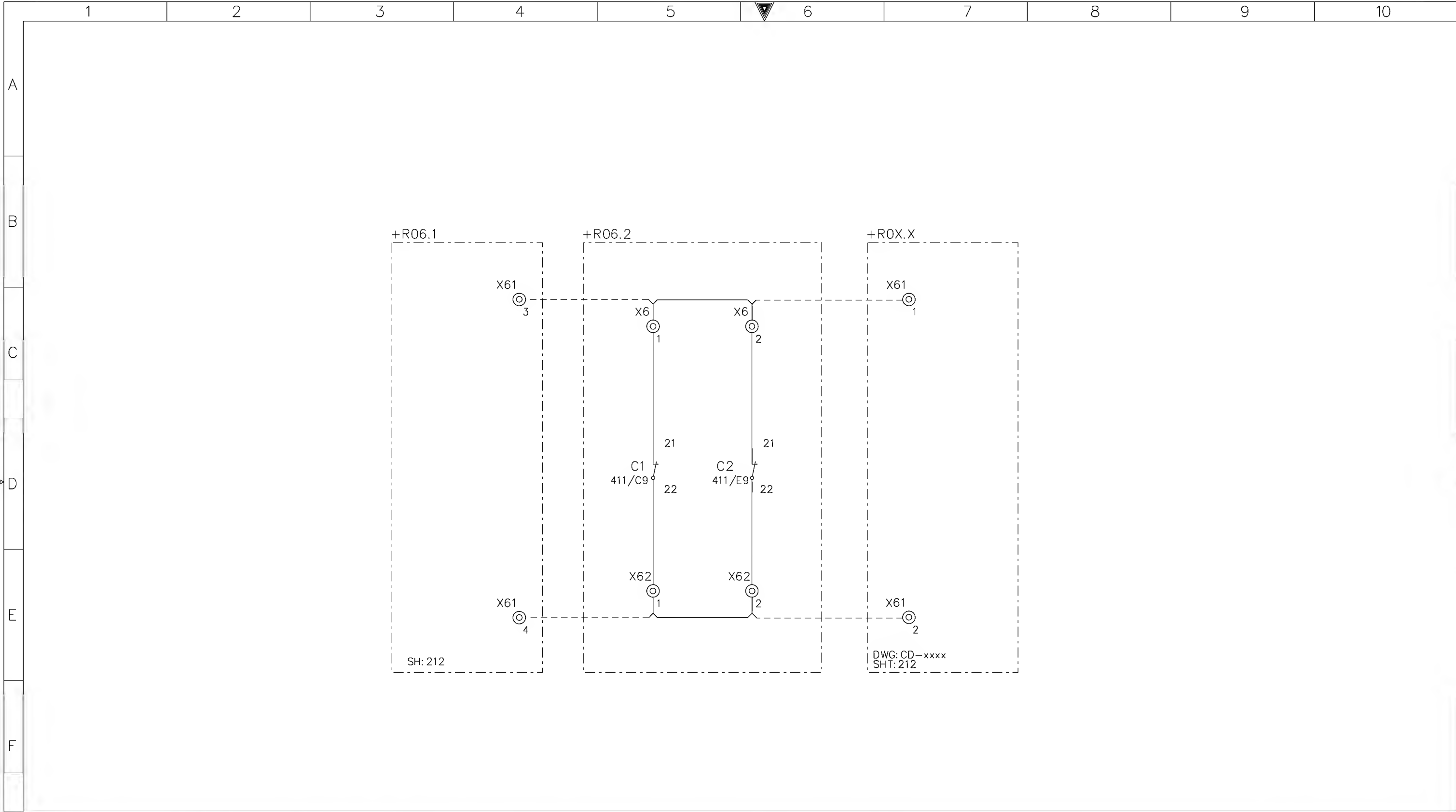
AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

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| 01 | 13 49 | FACTORY ASBUILT |
| 00 | 13 04 | FOR APPROVAL |
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DRAWN BY RIZ CHECKED BY KVR
DATE STARTED 24.01.2013 DATE COMPLETED _____
OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

AC SUPPLY FOR ILLUMINATION & POWER SOCKET
132kV UGF-SPARE-2 RELAY PANEL-1/2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

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| الشركة الوطنية لنقل الكهرباء | | نقل الكهرباء | | National Grid sa | | | |
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| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 DATE COMPLETED _____ |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC |

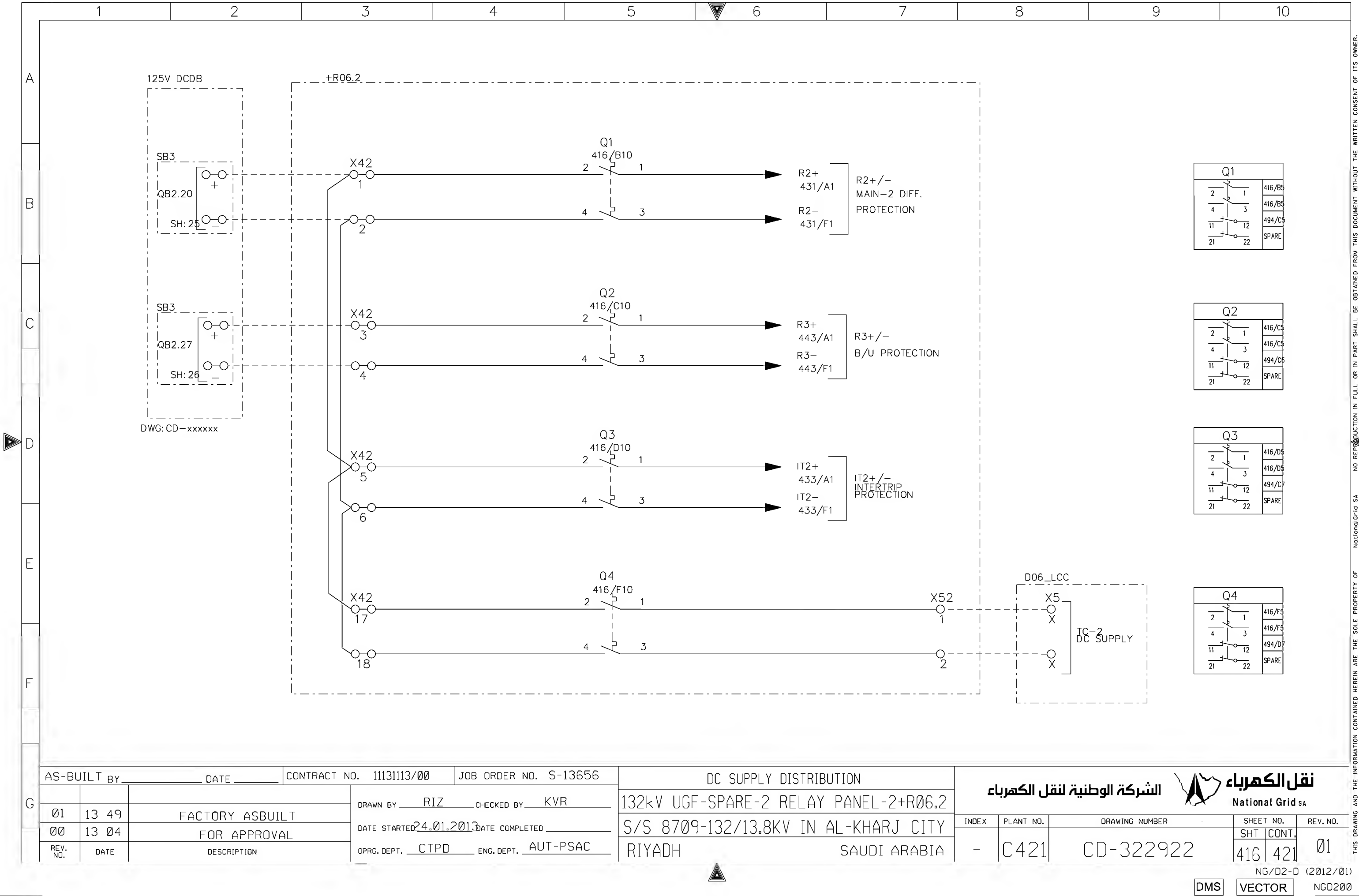
AC MCB AUX CONTACTS

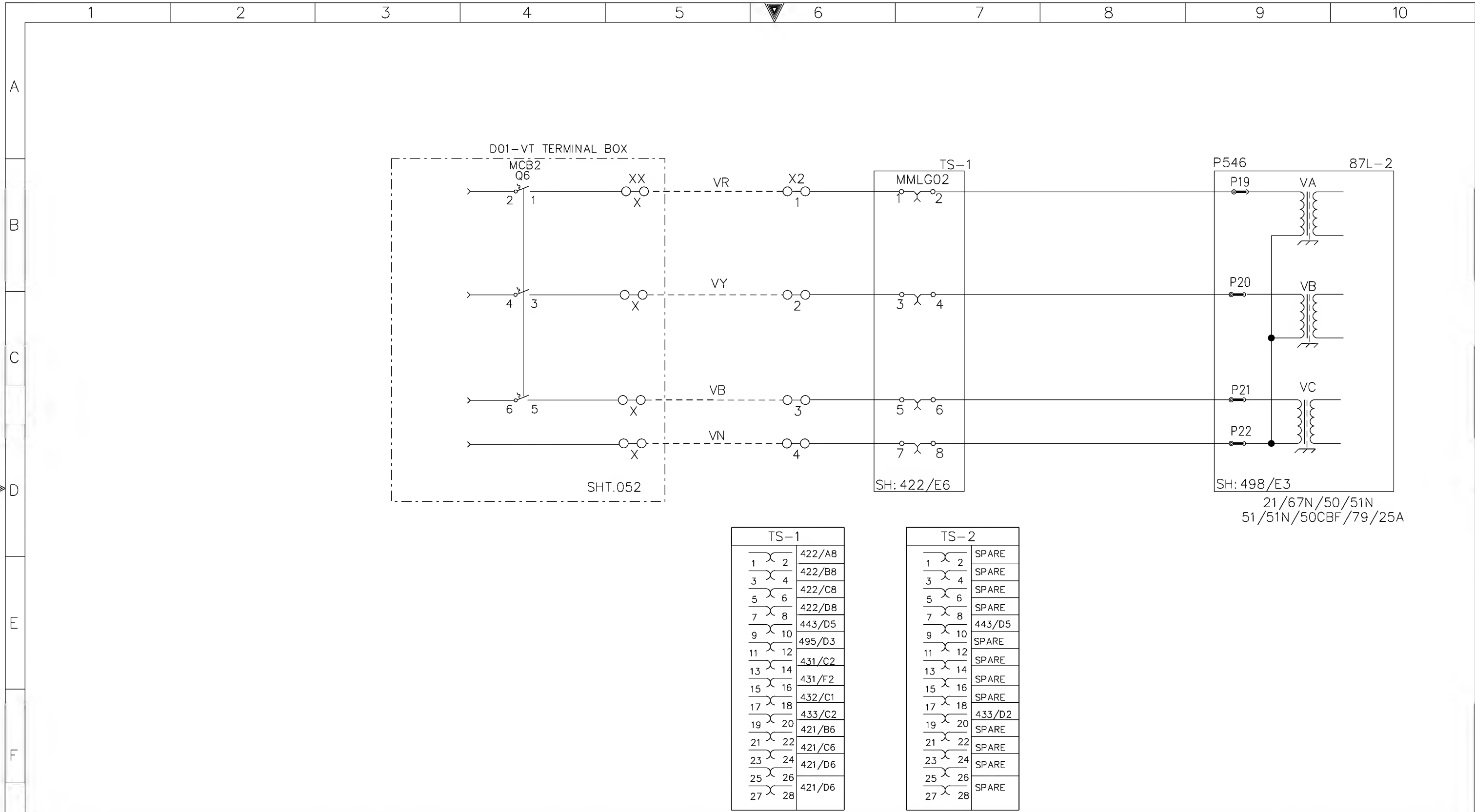
132kV UGF-SPARE-2 RELAY PANEL-2+R06.2

S/S 8709-132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

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| الشركة الوطنية لنقل الكهرباء | | نقل الكهرباء | | National Grid sa | |
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| TS-1 | |
|---------|--------|
| 1 X 2 | 422/A8 |
| 3 X 4 | 422/B8 |
| 5 X 6 | 422/C8 |
| 7 X 8 | 422/D8 |
| 9 X 10 | 443/D5 |
| 11 X 12 | 495/D3 |
| 13 X 14 | 431/C2 |
| 15 X 16 | 431/F2 |
| 17 X 18 | 432/C1 |
| 19 X 20 | 433/C2 |
| 21 X 22 | 421/B6 |
| 23 X 24 | 421/C6 |
| 25 X 26 | 421/D6 |
| 27 X 28 | 421/D6 |

| TS-2 | |
|---------|--------|
| 1 X 2 | SPARE |
| 3 X 4 | SPARE |
| 5 X 6 | SPARE |
| 7 X 8 | SPARE |
| 9 X 10 | 443/D5 |
| 11 X 12 | SPARE |
| 13 X 14 | SPARE |
| 15 X 16 | SPARE |
| 17 X 18 | SPARE |
| 19 X 20 | 433/D2 |
| 21 X 22 | SPARE |
| 23 X 24 | SPARE |
| 25 X 26 | SPARE |
| 27 X 28 | SPARE |

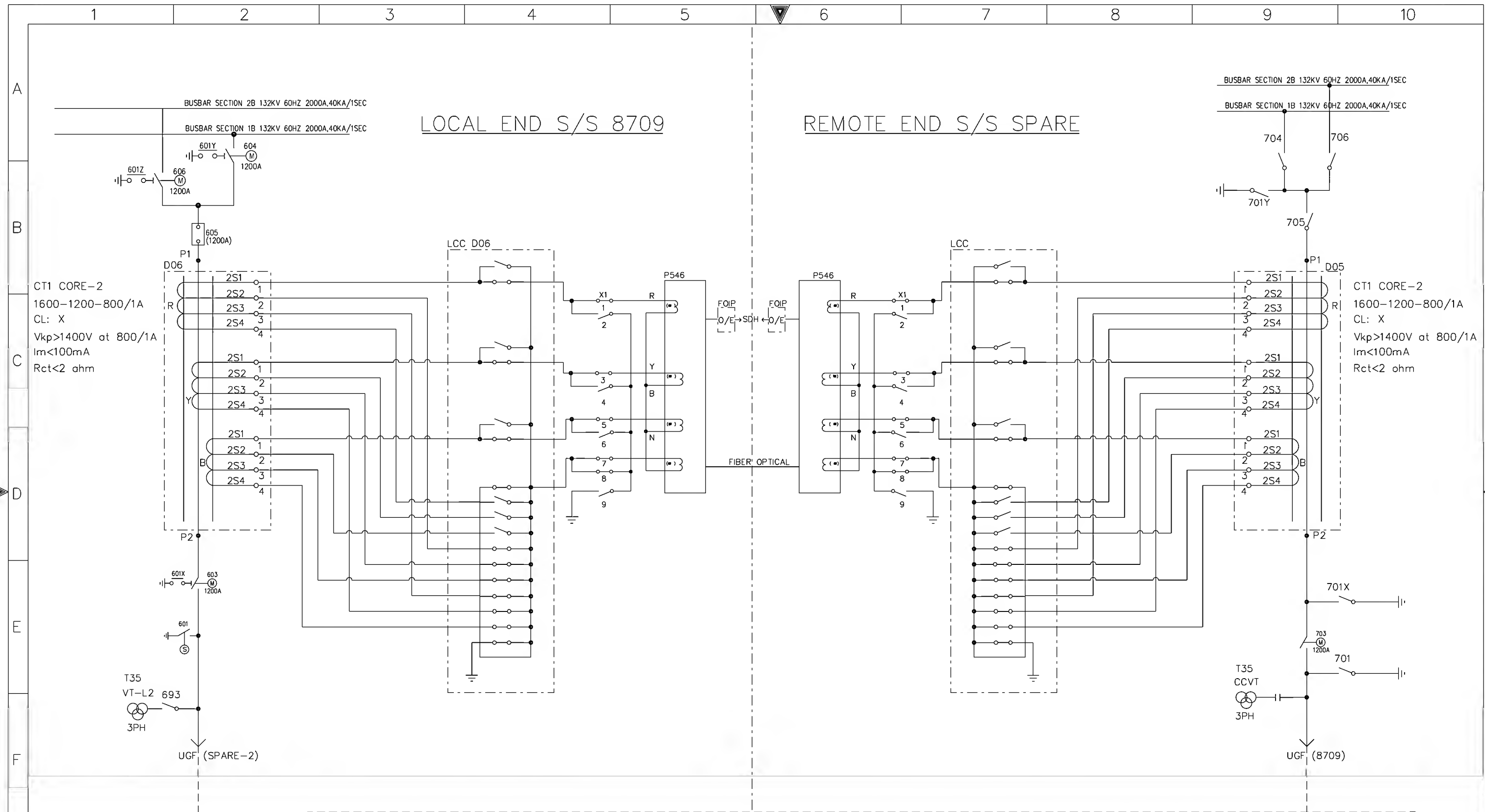
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| 00 | 13 04 | FOR APPROVAL |
| REV. NO. | DATE | DESCRIPTION |

DRAWN BY RIZ CHECKED BY KVR
DATE STARTED 24.01.2013 DATE COMPLETED _____
OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

VOLTAGE TRANSFORMER INPUTS -87L-2
132kV UGF-SPARE-2 RELAY PANEL-2+R06.2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

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|------------------------------|----------------|---|-----------|------------------|----------|
| الشركة الوطنية لنقل الكهرباء | |  | | نقل الكهرباء | |
| | | | | National Grid SA | |
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+R06.2

AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

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| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED _____ |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC |

COMMUNICATION CIRCUITS

132kV UGF-SPARE-2 RELAY PANEL-2+R06.2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



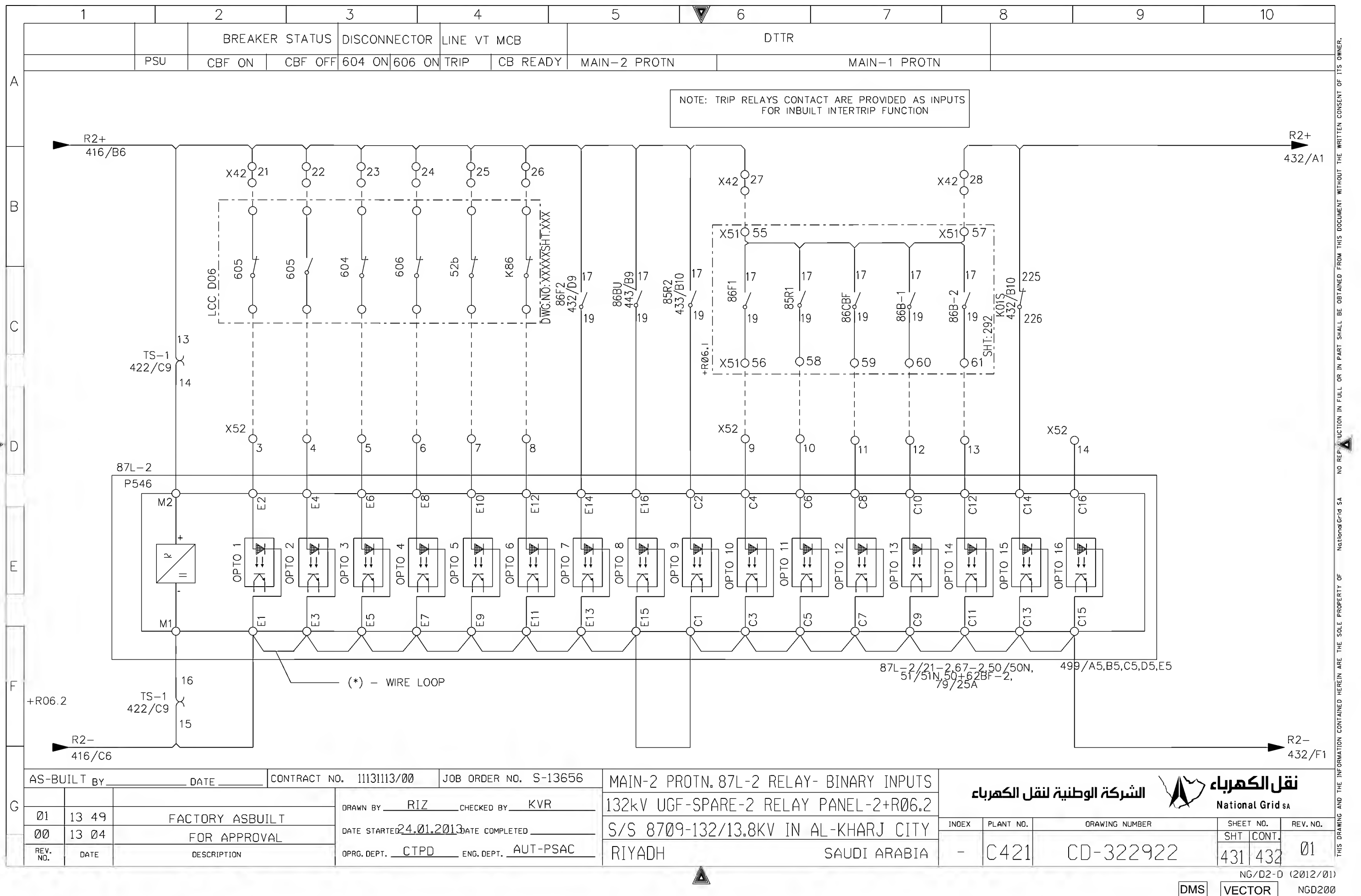
National Grid SA

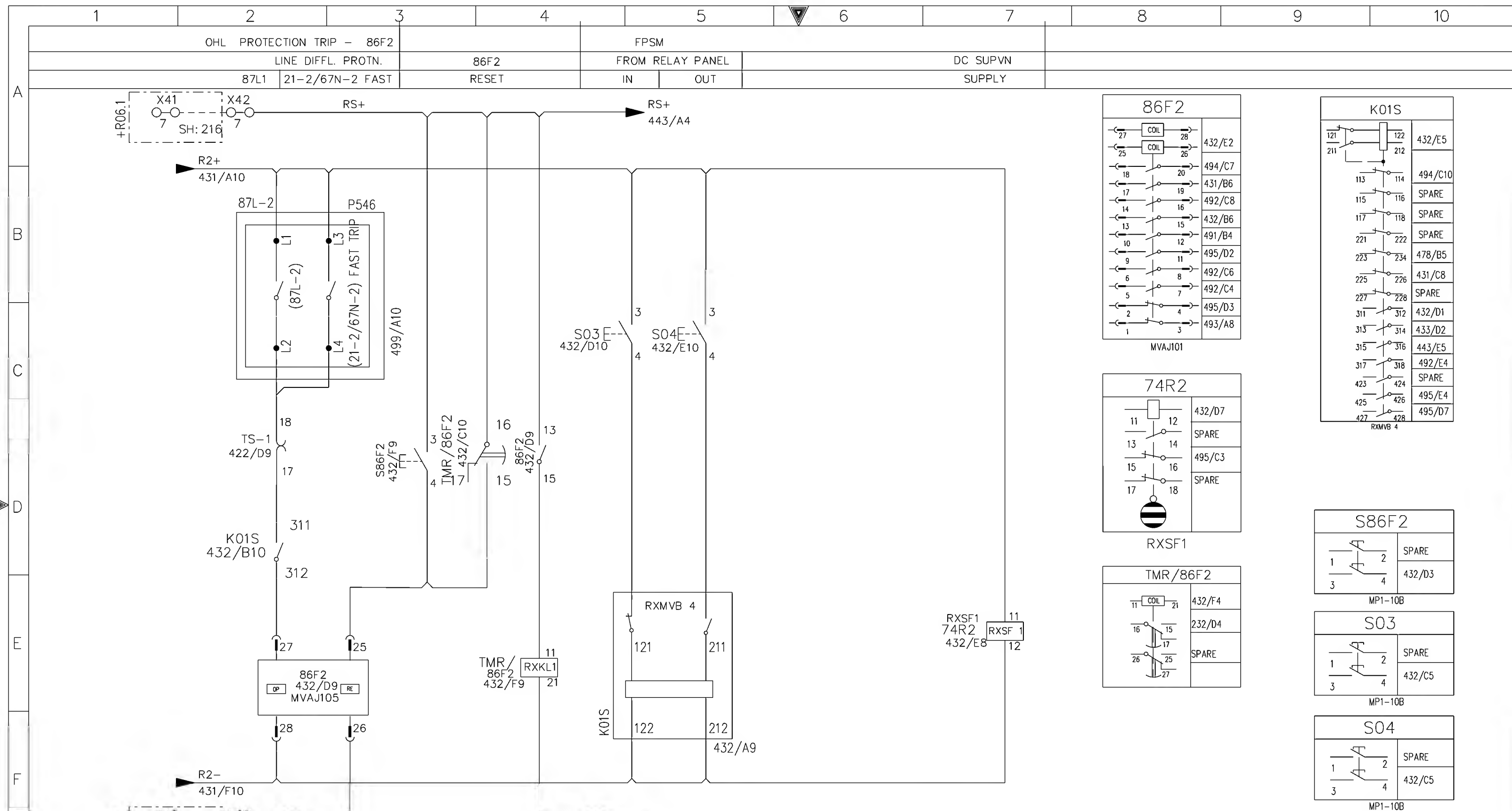
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| - | C421 | CD-322922 | 423/431 | 01 |

DMS

VECTOR

NGD200





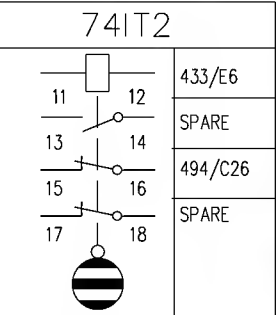
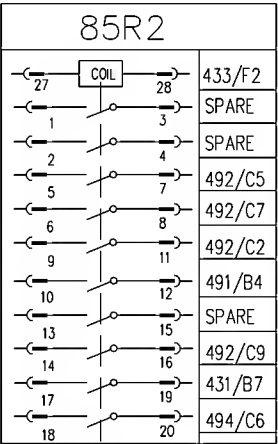
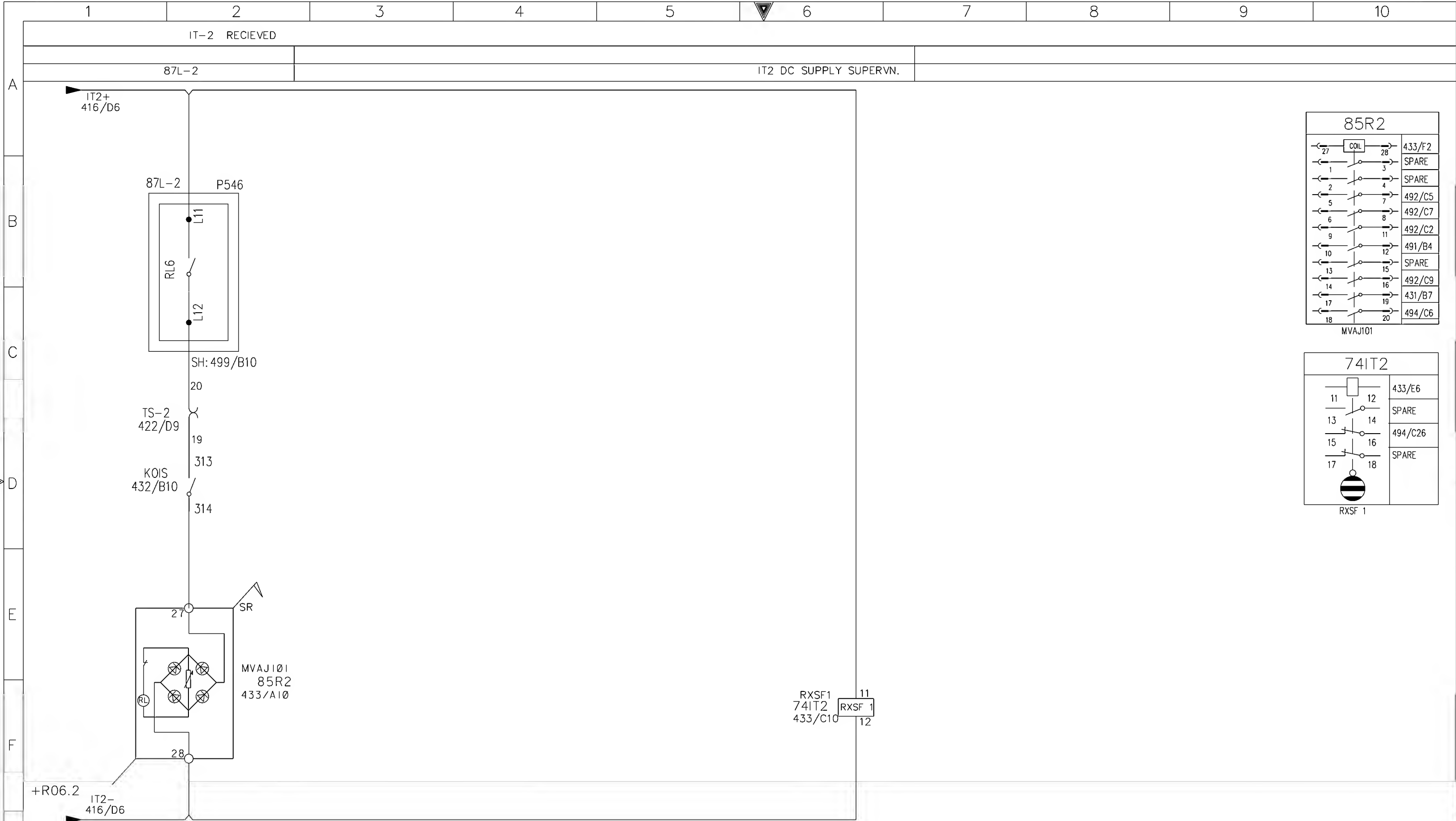
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|------------------------------|-------|---------------------------------|--------------------------|--|-----------------------|--|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | |
| 01 | 13 49 | FACTORY ASBUILT FOR APPROVAL | DRAWN BY RIZ | | CHECKED BY KVR | |
| 00 | 13 04 | | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | |
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MAIN-2 DISTANCE. PROTECTION TRIP RELAY CKT.
132kV UGF-SPARE-2 RELAY PANEL-2+R06.2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

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| الشركة الوطنية لنقل الكهرباء | | |  نقل الكهرباء National Grid SA | | |
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AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

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| 00 | 13 04 | FOR APPROVAL |
| REV. NO. | DATE | DESCRIPTION |

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.01.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

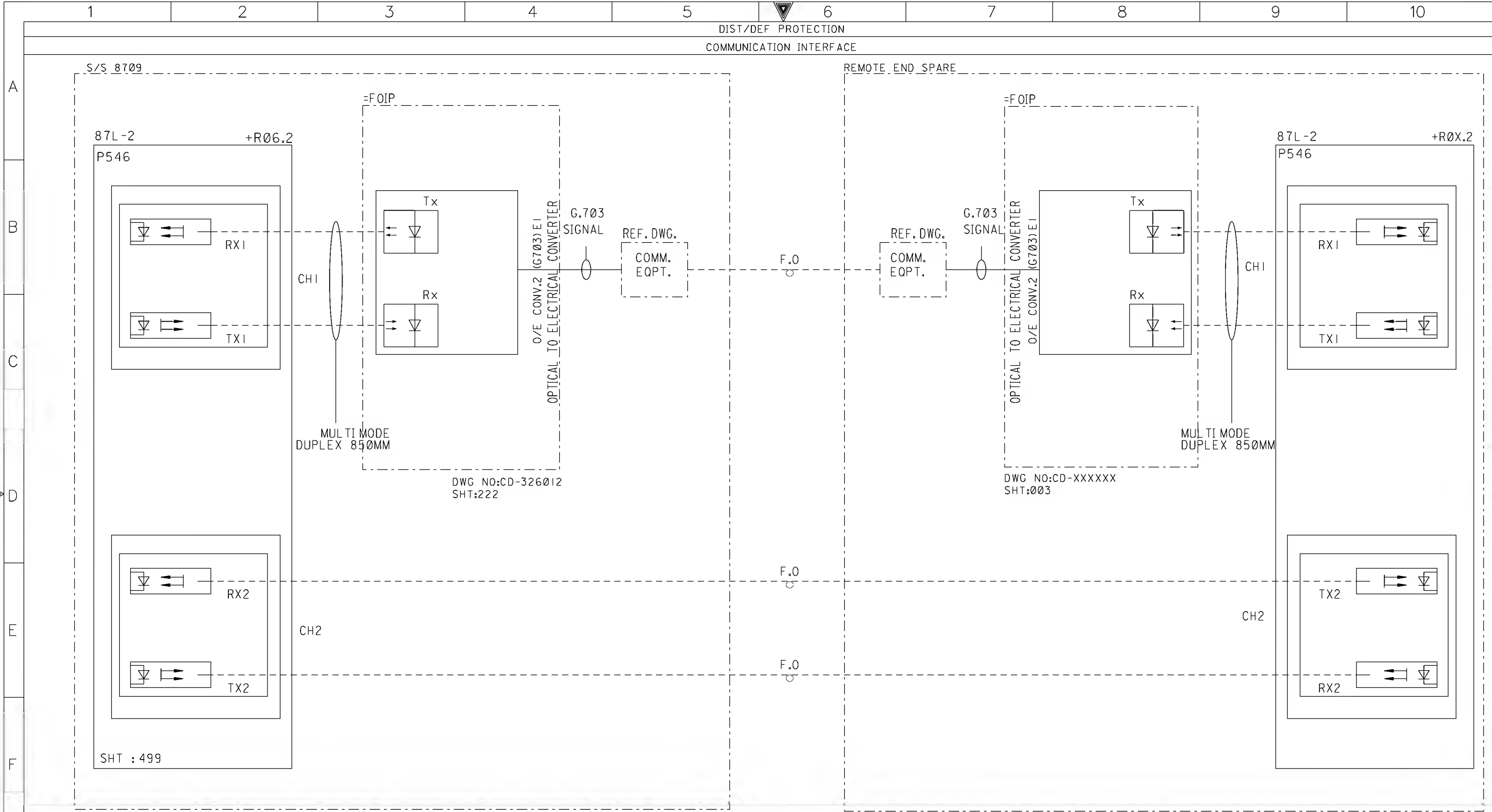
MAIN-2 DISTANCE. PROTECTTION TRIP RELAY CKT.

132kV UGF-SPARE-2 RELAY PANEL-2+R06.2

S/S 8709-132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

| | | | | | |
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| الشركة الوطنية لنقل الكهرباء | | نقل الكهرباء | | National Grid sa | |
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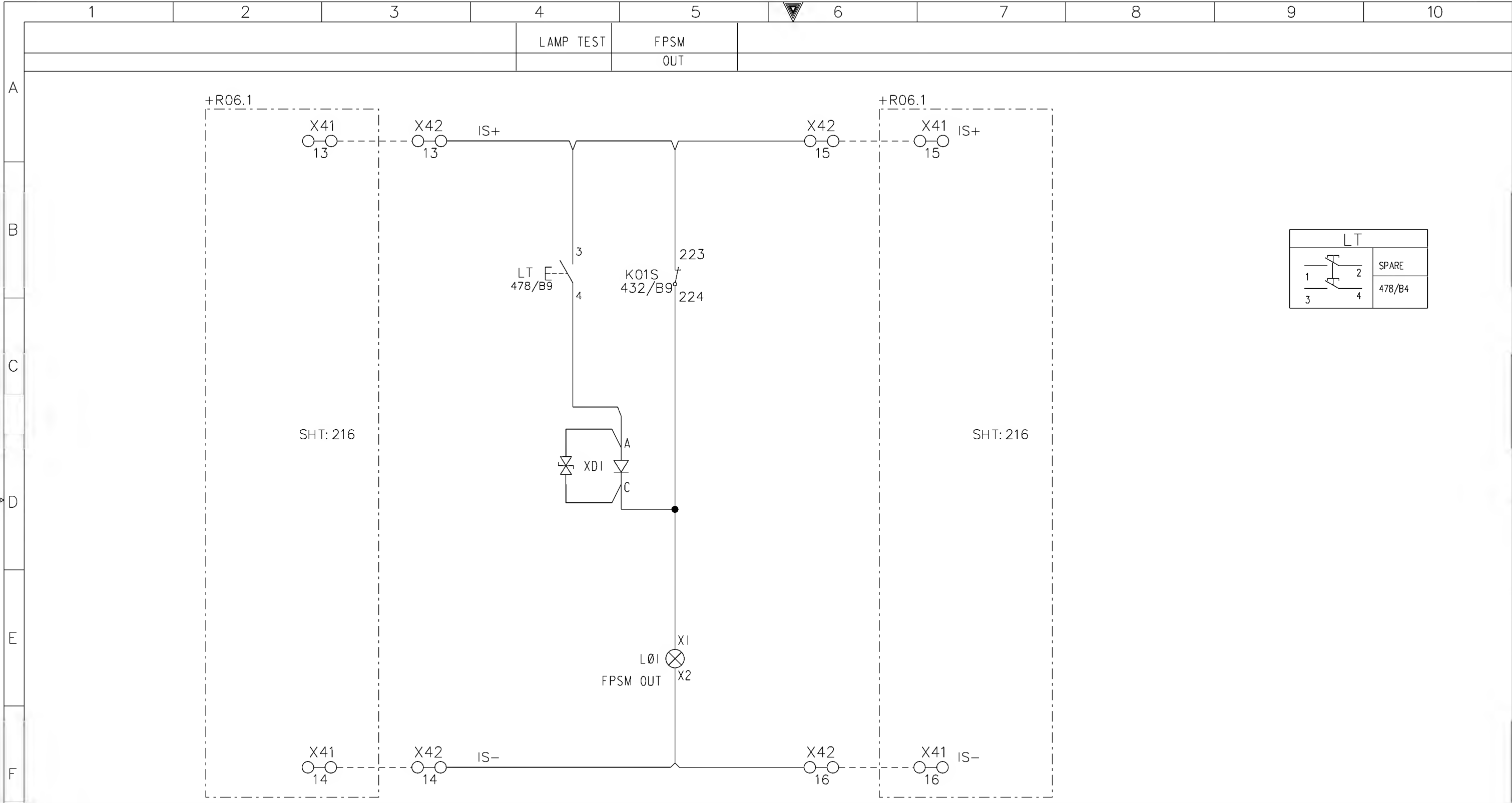
COMMUNICATION INTERFACE

132kV UGF-SPARE-2 RELAY PANEL-2+R06.2

S/S 8709-132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

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ENG. DEPT. AUT-PSAC


MAIN-2 INDICATION CIRCUIT

132kV UGF-SPARE-2 RELAY PANEL-2+R06.2

S/S 8709-132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

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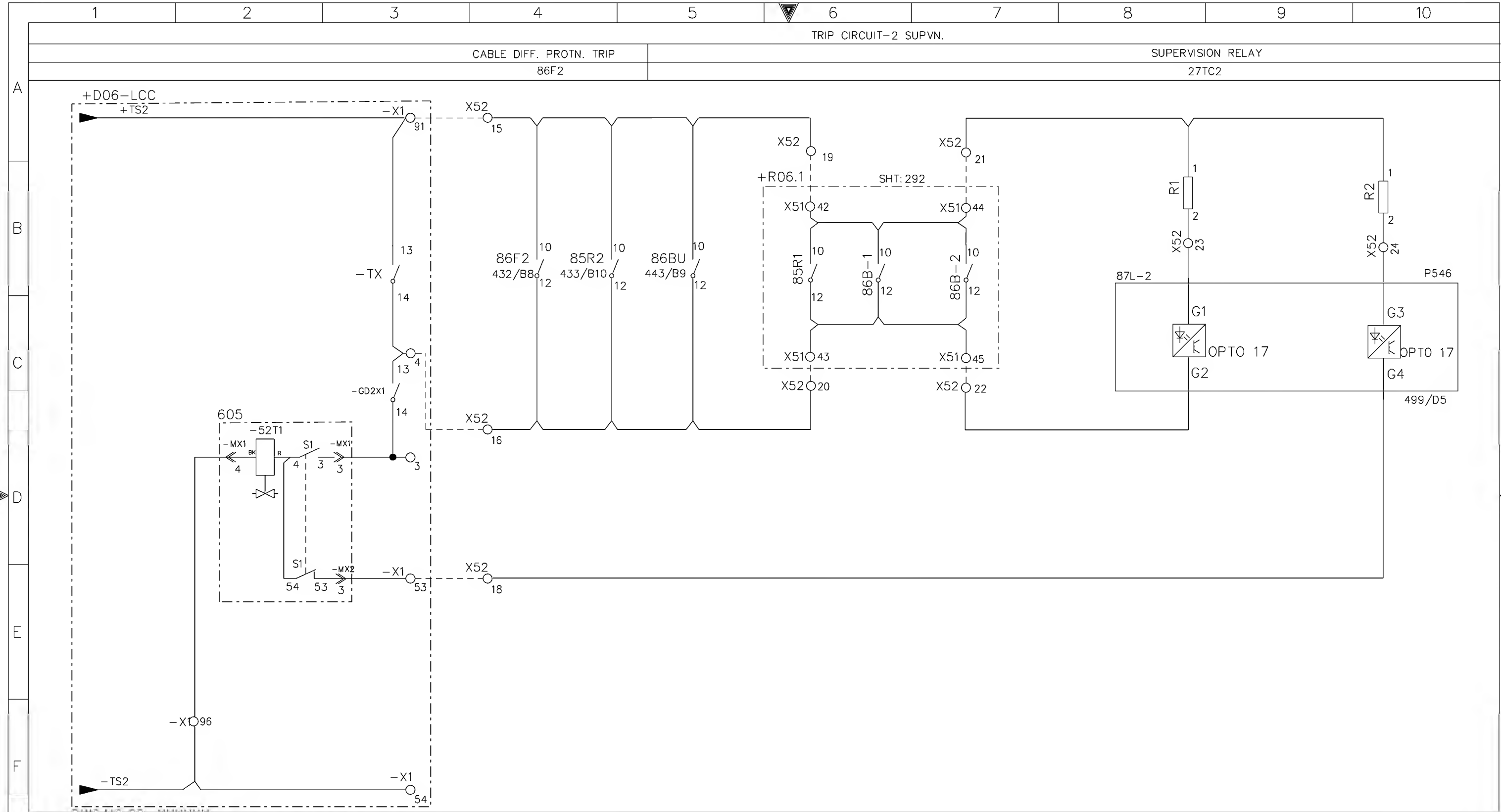
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NG/D2-D (2012/01)

DMS

VECTOR

NGD200



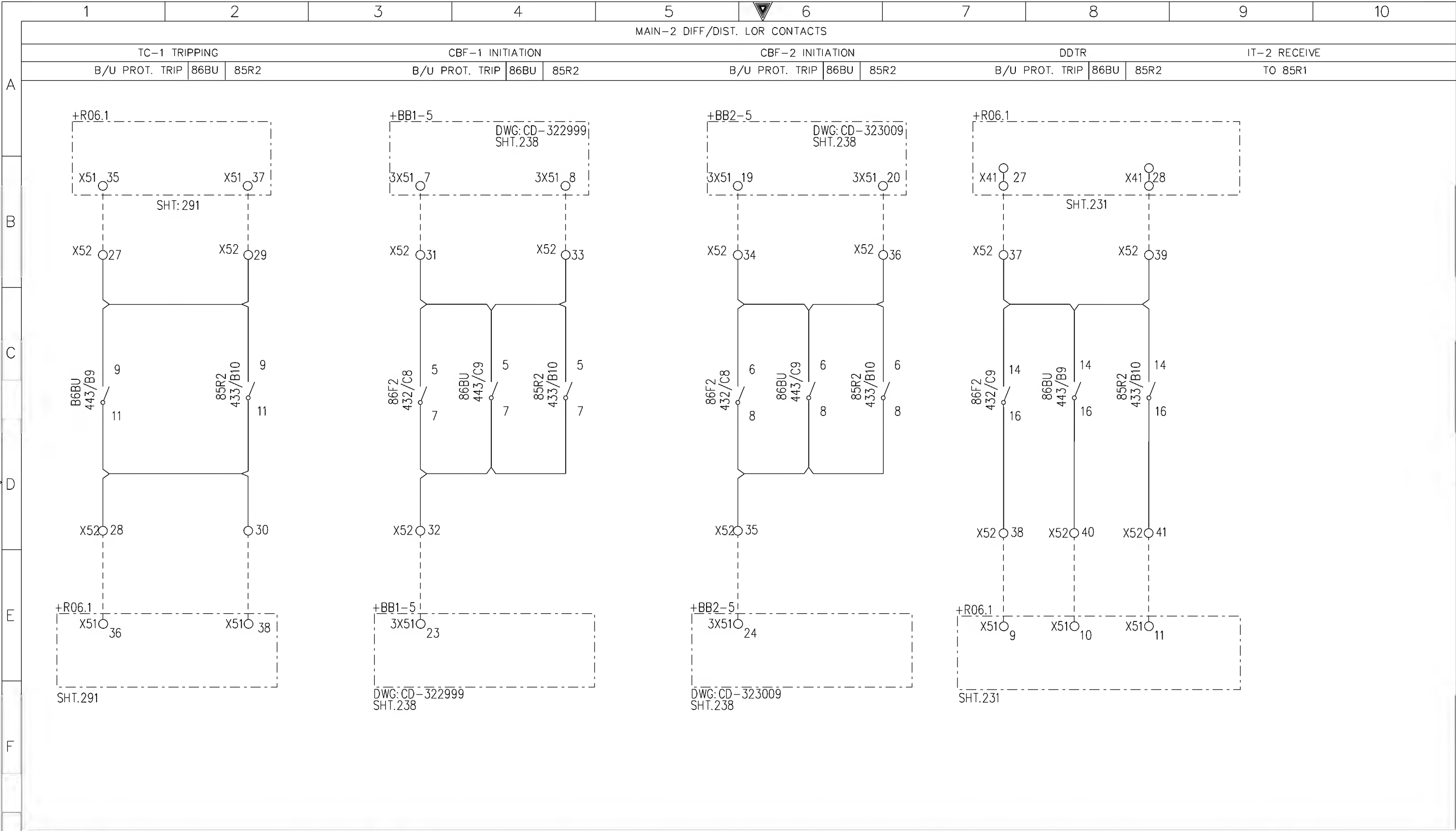
+R06.2

AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

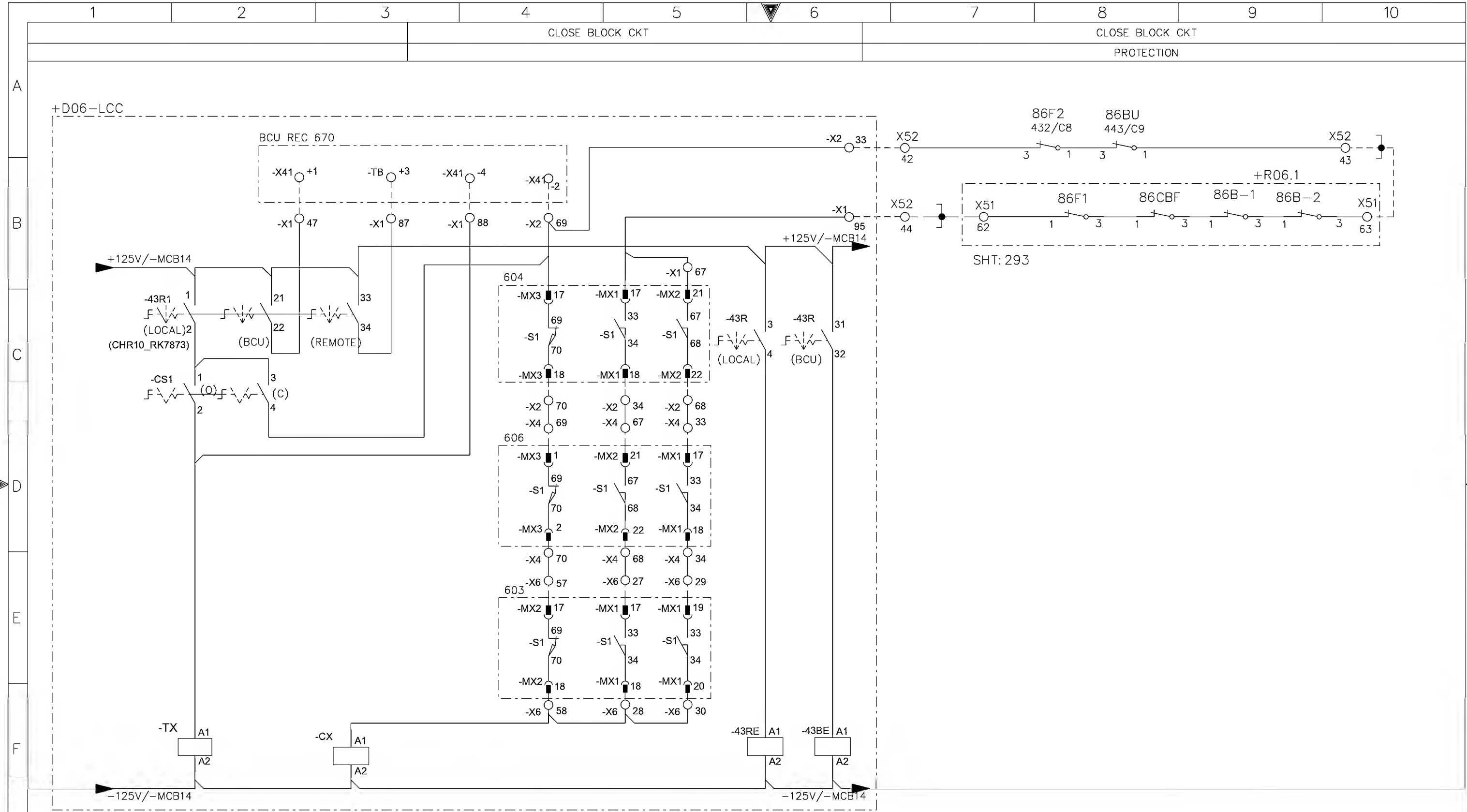
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TRIP COIL-2 SUPERVSION CIRCUIT
132kV UGF-SPARE-2 RELAY PANEL-2+R06.2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

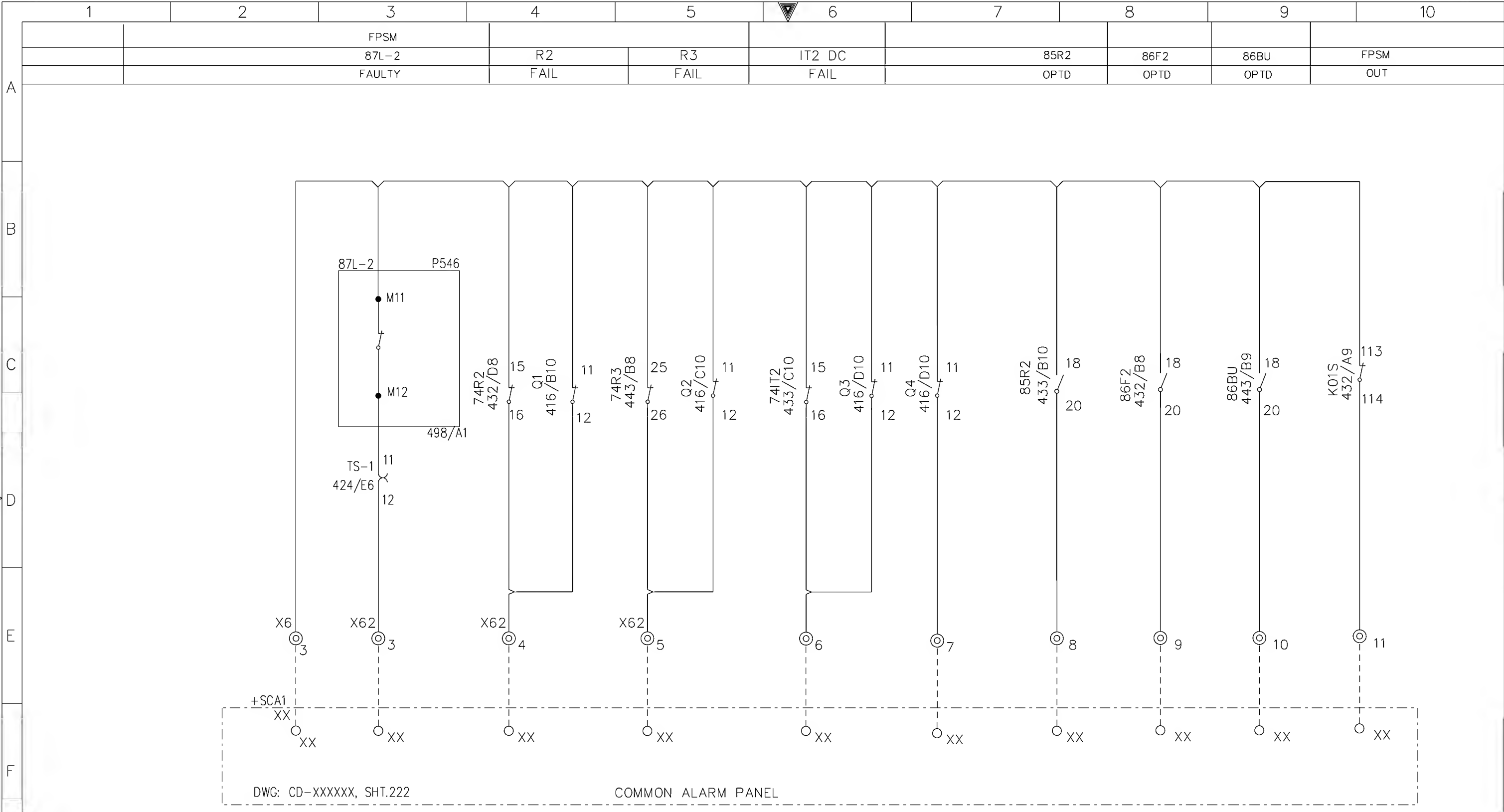
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| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | TRIP COIL-1 & CBF INITIATION CONTACTS | | <div>الشركة الوطنية لنقل الكهرباء National Grid sa</div> | |
| DRAWN BY RIZ CHECKED BY KVR | | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | 132kV UGF-SPARE-2 RELAY PANEL-2+R06.2 | | | |
| FACTORY ASBUILT | | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO. | |
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| REV. NO. DATE DESCRIPTION | | | | | | | | | NG/D2-D (2012/01) DMS VECTOR NGD200 | |



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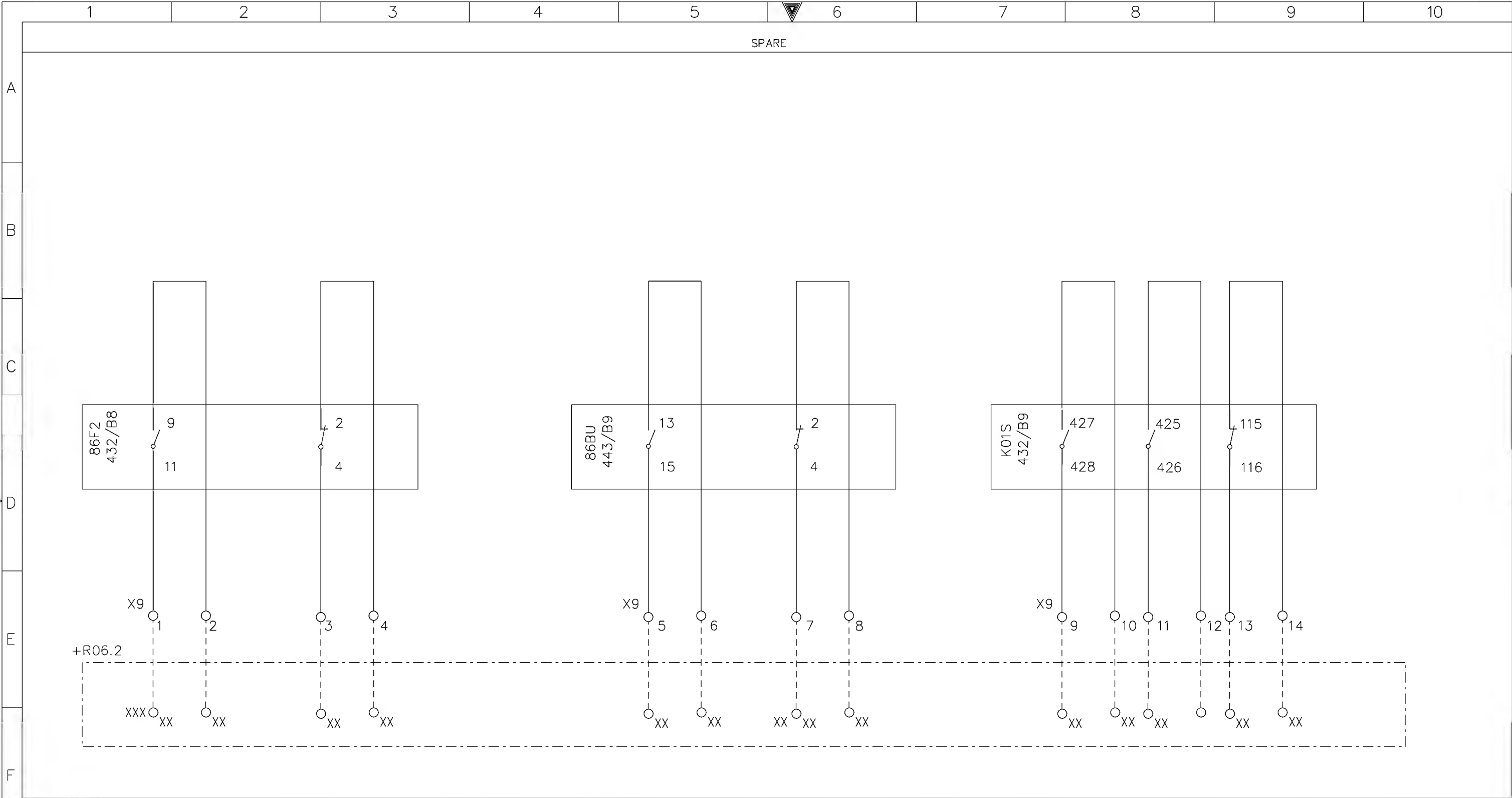
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|---------------------------------------|--|--------------|--|
| COMMON ALARM CIRCITS | | | |
| 132kV UGF-SPARE-2 RELAY PANEL-2+R06.2 | | | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | |
| RIYADH | | SAUDI ARABIA | |

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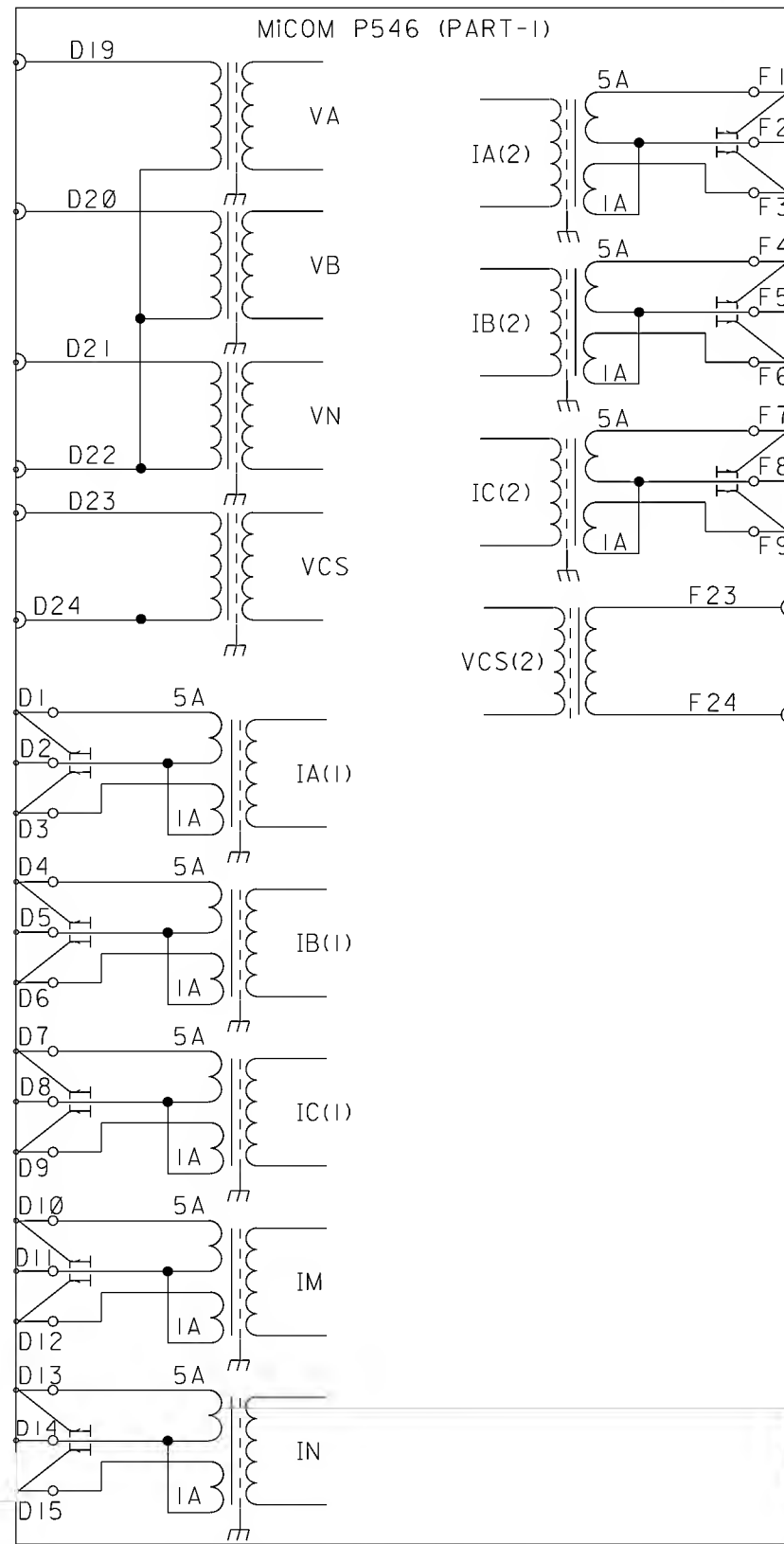
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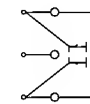
422/B9,C9

421/B8,C8,D8



NOTES:

(A)



C.T SHORTING LINKS

(B)



PIN TERMINAL (P.C.B TYPE)

2, USED FOR SELF PROTECTION I_N SENSITIVE SHOULD BE DRIVEN FROM A CORE BALANCE CT WHEN SENSITIVE SETTINGS ARE USED

3, I_M INPUT IS FOR OPTIONAL MUTUAL COMPENSATION

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BLOCK REFERENCE

132kV UGF-SPARE-2 RELAY PANEL-2+R06.2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

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DMS

VECTOR

NG/D2-D (2012/01)

NGD200

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| B | | | | | | | | | | |
| C | | | | | | | | | | |
| D | | | | | | | | | | |
| E | | | | | | | | | | |
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OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC


TERMINAL BLOCKS PANEL

132kV UGF-SPARE-2 RELAY PANEL-2+R06.2

S/S 8709-132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

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